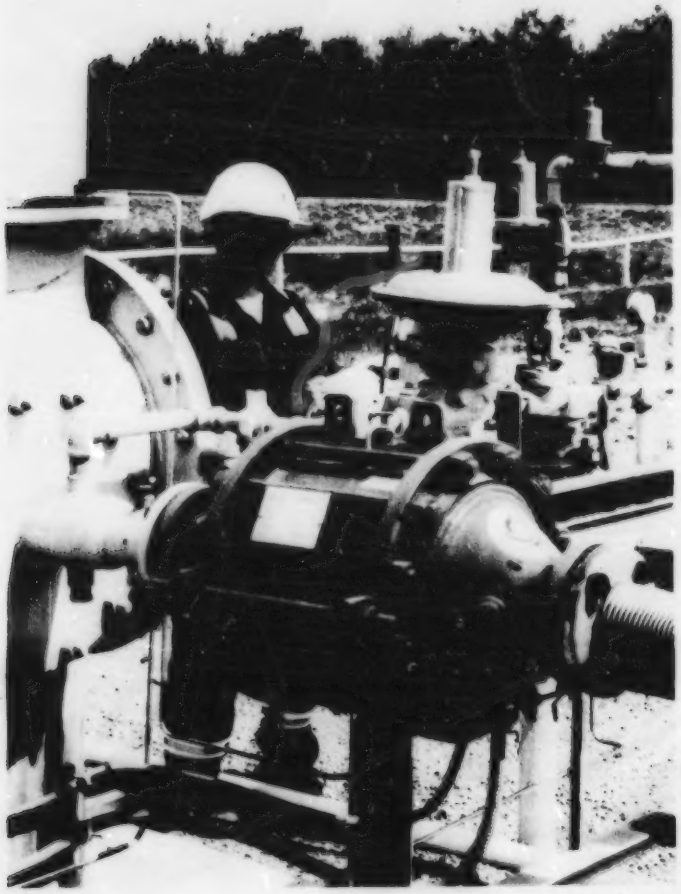
Statistical Series 57

EUB

# Field Surveillance Provincial Summary

## April 2001/March 2002



Alberta Energy and Utilities Board

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# Field Surveillance Provincial Summary

## April 2001/March 2002

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**Statistical Series 57: Field Surveillance Provincial Summary**
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# Executive Summary

The EUB is responsible for inspecting the over 110 000 operating wells, 15 911 oil batteries and associated satellites, 456 sweet gas plants, 247 sour gas plants, and over 300 000 kilometres of pipelines that form the core of Alberta's energy infrastructure. It is also EUB field staff's responsibility to enforce standards and conditions set out in licences, approvals and regulations.

This annual *Field Surveillance Provincial Summary* details the wide range of activities carried out by EUB field staff. The report provides information on industry compliance and EUB enforcement actions, shows trends, and assists the EUB in planning its inspection and enforcement strategies.

## The Field Surveillance Role

Operating out of eight EUB Field Centres located throughout Alberta, 115 field staff inspect construction, operation, and abandonment operations at oil, gas, and oil sands facilities (including pipelines, compressors, and processing plants). They respond to emergencies and public complaints on a 24-hour basis, facilitate resolution of landowner-industry conflicts, participate in public-industry liaison committees, and ensure a consistent approach to enforcement of requirements with noncompliant operators.

Adding twelve new field staff in 2001/2002 helped the Field Surveillance Branch accomplish its inspection goals and increase emphasis on priority areas, such as

- reducing pipeline corrosion,
- public safety and sour gas initiatives,
- increasing air monitoring for hydrogen sulphide ($H_2S$) odours, and
- substantially increasing inspections of well test flaring at gas production sites.

With oil and gas industry activity continuing at record pace, vast sums of money being committed to oil sands development, and sour gas drilling and development increasing, the EUB expects more emphasis to be placed on its role of overseeing the safe, responsible, and orderly development of Alberta's energy resources. In the face of increasing activity and the associated issues that presents, we remain committed to our vision of building a regulatory framework that inspires public confidence.

Following is a brief summary of the overall inspection statistics, results, and field staff activities reported in the Field Surveillance Provincial Summary 2001/2002.

## A Brief Summary of Field Surveillance in 2001/2002

### Inspections

The EUB was able to keep pace with activity levels in what was a near record year for energy development:

- 14 307 wells were drilled in 2001/2002, a slight decrease from the 2000/2001 record of 14 621.
- 8407 initial inspections and 2129 reinspections were completed, a slight increase over 2000/2001.

While industry improvements were noted in areas such as drilling and servicing, the overall percentage of major and serious unsatisfactory inspections increased from 3.3 per cent of total inspections to 4.4 per cent. This increase is partly attributed to increased air monitoring of off-lease $H_2S$ odours and increased inspection requirements. (See Table 1 for a summary of 2001/2002 inspection results.)

### Enforcement

The EUB is confident that in general Alberta's energy industry strives to comply with EUB regulations, requirements, and programs. However, while comfortable, we are not complacent - companies that fail to meet requirements or follow EUB direction are subject to escalating enforcement consequences. Enforcement actions always include deadlines for fixing a problem and may be reinforced by penalties, such as temporary or long-term suspension of operations, closure, or refusal of applications.

In 2001/2002 the number of facilities the EUB ordered suspended decreased significantly to 142 facilities, from 236 in 2000/2001. However, the cost to industry was greater: $16.3 million, compared to $12 million in 2000/2001 (see Table 2).

### Well Control Occurrences

Blows and blowouts during drilling and servicing operations are among the most serious incidents for well operations and have the potential to cause public safety and environmental impacts. The EUB regards the number of blows, blowouts, and kicks as a primary indicator of industry's drilling and servicing performance and pays particularly close attention to industry's response to these incidents.

Requirements for high training standards and sophisticated blowout detection and prevention equipment have helped to keep well control occurrences to a minimum. Of the 14 307 wells drilled in 2001/2002, the EUB recorded

- 2 blowouts and 1 blow during drilling operations, and
- 6 blowouts and 1 blow during servicing.

All were brought under control with minimal environmental damage and no public safety impacts.

### Flaring

The impact gas production facilities have on the public continues to be of concern to the EUB. Fugitive emissions, noise from compressors, black smoke, and flaring are the primary issues affecting the public. In response we have

- increased gas production inspections by 76 per cent (1778 inspections in 2001/2002, compared to 968 in 2000/2001), and
- increased inspections of well test flaring operations by 69 per cent (122 inspections in 2001/2002, compared to 72 in 2000/2001).

Industry has adopted an emphasis on flaring reduction. This responsive attitude, along with a surveillance program that encourages industry to reduce flaring at gas processing plants, appears to have had a positive effect, contributing to a reduction in public complaints:

- 113 in 2000/2001, compared to 77 in 2001/2002.

Inspection audits of well test flaring operations will continue to be a priority. EUB field staff will focus on flaring operations in populated areas and on those wells containing greater than 5 per cent $H_2S$.

### Spills

The EUB's goal is to minimize the environmental impacts of liquid releases (spills) by working cooperatively with industry and other government agencies.

- 100 per cent of all liquid releases that pose any kind of public safety or environmental threat are inspected. There were 30 such releases in 2001/2002.
- More than 75 per cent of liquid releases were low volume, and most were contained on lease.
- 1434 liquid releases were reported in 2001/2002, a decrease from the 1475 in the previous year.

### Pipelines

In 2001/2002, 18 777 kilometres (km) of new pipeline were connected to Alberta's pipeline infrastructure, bringing the total to 306 618 km of energy-related pipeline. Despite having more pipeline in operation, the overall picture of pipeline performance improved in 2001/2002. EUB field staff recorded higher percentages of satisfactory inspections in each of the four key pipeline inspection areas: pipeline hits/failures, construction and pressure testing, operations inspections, and contact damage.

Of the 523 inspections conducted on pipeline failures/hits in 2001/2002, the EUB recorded

- 23 major unsatisfactory inspections (4.4 per cent) and 1 serious unsatisfactory inspection—all were brought into compliance;
- 32 ruptures, compared to 39 in 2000/2001;
- a failure frequency of approximately 2.8 failures/1000 km—a substantial improvement over the 1988 benchmark of 5 failures/1000 km;
- 503 pipeline corrosion incidents, down from 641 in 2000/2001.

The EUB emphasizes reducing pipeline corrosion. We investigate 100 per cent of corrosion system failures where the failure mechanism is unknown. As well, sensitive leak detection systems, training and awareness programs, automated shut-in equipment, and pipeline patrols (aerial and ground) being used by the industry are working to reduce the effects of pipeline failures.

### Responding to Public Concerns

One of the measures of the EUB's performance is our responsiveness to public complaints. Although the activity level in the oil and gas industry remained high in 2001/2002, the number of public complaints decreased marginally in most categories compared to last year:

- 881 complaints in 2001/2002 (a decrease of 5 per cent compared to 2000/2001).

The EUB receives complaints on a variety of issues (see Figure 4 for a distribution of complaints by issue). The most common issue is odours:

- 367 odour complaints, a reduction of 10 per cent over last year.

Through increased surveillance, application of escalating enforcement for noncompliance, and active and extensive involvement with public and industry via synergy groups, open houses, and facilitation efforts, we believe public confidence in the EUB will strengthen and public complaints will continue to decrease.

In 2001/2002, Field Surveillance efforts to connect with the community included

- staff involvement in 142 facilitations, of which 76 were successfully resolved, 63 are ongoing, and only 3 required hearings;
- staff participation in 57 active synergy groups; and
- open houses in High Level, Midnapore, Rocky Mountain House, and Pincher Creek.

**Public Safety and Sour Gas Initiatives**

In January 2000, the EUB established a 22-member multistakeholder Advisory Committee on Public Safety and Sour Gas to review Alberta's sour gas regulatory system. The committee made a report of 87 recommendations, 12 of which specifically related to the Field Surveillance Branch's role.

In 2001/2002, Field Surveillance made significant progress on the recommendations, completing work on 8 of the 12. As a result, enhancements to sour gas surveillance processes include

- a documented incident response protocol that ensures timely response, investigation, enforcement, and follow-up of upstream petroleum incidents;
- increased frequency of inspections of sour facilities;
- creation of a "resident contact form" to assist field staff in determining whether residents within emergency response planning zones are aware of and understand emergency response plan (ERP) requirements;
- increased inspection frequency of new and noncompliant operators at sour gas facilities;
- inspection of 100 per cent of critical sour wells;
- priority treatment of public complaints related to sour gas;
- upgrading of existing air monitoring equipment and purchase of new equipment, enhancing the EUB's monitoring capabilities; and
- a staff training program on First Nation and Metis culture and a consultation program to ensure that First Nation and Metis communities are aware of and able to access the EUB's complaint and incident program.

Work continues on all the recommendations, with ongoing revisions and refinements expected. Copies of the committee's report and EUB quarterly progress reports are available from the EUB and on our Web site at <www.eub.gov.ab.ca>.

# 1 Summary of Inspections, Enforcement, Public Complaints, Stakeholder Involvement Efforts, Major Initiatives, and Significant Events

## 1.1 Introduction

This *Provincial Summary* report provides stakeholders with information and statistics related to the activities of the Alberta Energy and Utilities Board's (EUB) Field Surveillance Branch. Analyses of the data indicate trends and are used for allocating resources and determining future Field Surveillance actions to improve industry's understanding of and compliance with EUB requirements.

The EUB's Field Surveillance Branch has eight Field Centres located throughout the province. In addition, a suboffice of the Bonnyville Field Centre is located in Fort McMurray and a suboffice of the Grande Prairie Field Centre is located in High Level (see Figure 1).

## 1.2 Role of Field Surveillance Staff

As part of the EUB's overall surveillance and enforcement role, field staff

- respond to and address complaints related to energy development and environmental issues;
- inspect drilling and service rigs, oil and gas production facilities, and pipelines to ensure that operators comply with all applicable standards, specifications, and approval conditions;
- take enforcement action when noncompliance occurs;
- focus on problem operators with poor inspection records with the goal of long-term improvements;
- concentrate on higher-risk facilities, such as sour gas wells, pipelines, and gas plants;

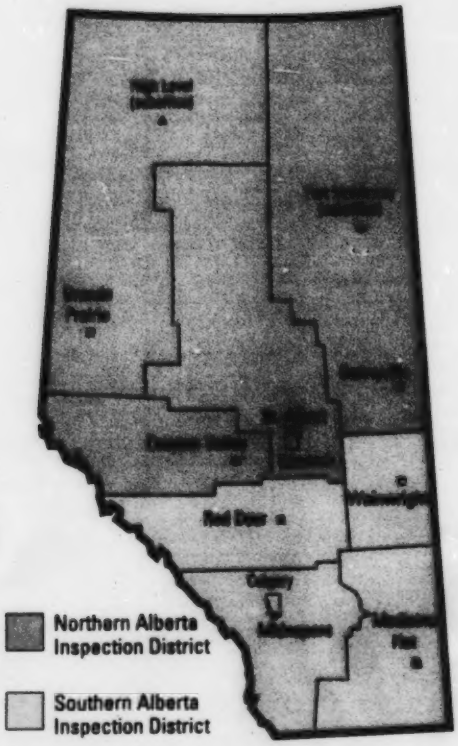



**Figure 1. EUB Field Centre boundaries**

- respond to oil and gas emergencies and monitor the cleanup of spills;
- attend meetings with the public and operators to assist in resolving issues;
- participate in community meetings to answer questions and provide information about the EUB's regulatory process; and
- educate industry on new and revised requirements.

The sections below summarize Field Surveillance Branch inspections, enforcement, public complaints, stakeholder involvement activities, and other key initiatives and events.

## 1.3 Inspections

EUB field inspections are prioritized based on the weighting of three key criteria: *operator* history, site *sensitivity*, and *inherent* risk (OSI) of the facility/operation. Field staff focus on operators with previous unsatisfactory inspections, including repeated non-compliance. Sensitivity is determined by whether the facility is in a forested or agricultural area, with inspection emphasis on areas with high numbers of public complaints and high frequency of environmental incidents. The inherent risk of a facility or operation is determined by reviewing specific technical details about the facility, such as the complexity of the operation and whether the facility is sweet or sour.

The total number of initial field inspections increased slightly, from 8279 during 2000/2001 to 8407 in 2001/2002. The percentage of satisfactory inspections remained

constant, at 64 per cent. The minor unsatisfactory inspection percentage decreased from 26 per cent in 2000/2001 to 25 per cent, while the overall percentage of major and serious unsatisfactory inspections increased from 3.3 per cent in 2000/2001 to 4.4 per cent in 2001/2002. The increase in the percentage of major and serious unsatisfactory inspections is due, in part, to the requirements detailed in *Guide 64: Facility Inspection Manual* and *Guide 66: Pipeline Inspection Manual* and the use of a second mobile air-monitoring unit.

***EUB Action***

- In order to meet our increased inspection goals, Field Surveillance added 12 staff in 2001/2002, bringing our staff complement to 115. The additional staff will allow Field Surveillance to increase emphasis on sour gas operations, noncompliant operators, air-monitoring activities, improving our working relationships with First Nations/Metis communities, and in the facilitation[1] and synergy group[2] areas.

Throughout this report, the terms "satisfactory" inspection and "minor," "major," and "serious" unsatisfactory inspections are used. It is important that the definition of each is understood to properly interpret the statistics. There are numerous requirements in each inspection discipline, and even if one noncompliance item is identified, the inspection is considered unsatisfactory. The definitions below include those for a minor, major, and serious unsatisfactory event/inspection from *Informational Letter (IL) 99-4: EUB Enforcement Process, Generic Enforcement Ladder, and Field Surveillance Enforcement Ladder* and apply to these terms throughout this report:

- **satisfactory event/inspection**—an inspection where all regulations/requirements are met by industry

- **minor unsatisfactory event/inspection**—a contravention of regulation(s)/ requirement(s) that does not result in a direct threat to the public and/or the environment and does not adversely affect oil and gas operations

  Examples of minor unsatisfactory inspection items are
  - pipeline signage missing, defaced, or displaying incorrect information,
  - garbage and debris not stored in a reasonable manner at an oil or gas facility, and
  - meter calibrations not completed at an oil and gas facility.

- **major unsatisfactory event/inspection**—a contravention of regulation(s)/ requirement(s) that an operator has failed to address and/or has the potential to cause an adverse impact on the public and/or the environment

  Examples of major unsatisfactory inspections items are
  - failure of blowout prevention (BOP) equipment on a drilling or service rig, and

[1] When members of the public have concerns about a particular industry project and the parties are having difficulty resolving issues on their own, Field Surveillance staff facilitate the resolution process. EUB staff assist to improve communications, information sharing, and identification of issues and options available and to ensure that EUB requirements are understood.

[2] To ensure that the impact of resource development and operations is minimized on an ongoing and proactive basis, synergy groups are formed to identify issues and work on collaborative solutions to the problems identified. Synergy groups usually involve public, industry, and appropriate government representatives. EUB staff assist and support the organization of these groups, but the strength and success of the groups lie in the direct involvement of participants.

- not properly informing stakeholders of proposed development and/or application, as per *Guide 56: Energy Development Application Guide.*

- **serious unsatisfactory event/inspection**—a total disregard for regulation(s)/ requirement(s) that is causing or may cause a significant impact on the public and/or environment

  Examples of serious unsatisfactory inspection items are
  - conducting an activity without an approval where an approval is required, and
  - unaddressed release into water, where the operator was aware, but no action taken.

Table 1 summarizes the field inspections that occurred in 2001/2002 and includes the number of initial[3] inspections and reinspections[4] in each category. Each inspection category includes the number of satisfactory, minor, major, and serious unsatisfactory inspections.

## 1.4 Enforcement

The Field Surveillance Branch developed generic enforcement ladders to ensure that a firm, fair, and consistent approach is taken in all noncompliance situations. Enforcement actions escalate to a higher level if a company repeatedly fails to meet EUB requirements.

**Table 1. Field inspections, 2001/2002[1]**

| | Initial | Satisfactory | Minor unsatisfactory | Major unsatisfactory | Serious unsatisfactory | Reinspection |
|---|---|---|---|---|---|---|
| Drilling rigs | 499 | 448 | 32 | 19 | 0 | 0 |
| Service rigs | 262 | 237 | 18 | 6 | 1 | 0 |
| Oil production facilities | 3 562 | 2 273 | 1 145 | 137 | 7 | 1 375 |
| Gas production facilities | 1 778 | 1044 | 659 | 74 | 1 | 693 |
| Pipeline construction/ testing | 497 | 443 | 38 | 16 | 0 | 23 |
| Pipeline failure inspections | 523 | N/A | N/A | 23 | 1 | 0 |
| Pipeline operations inspections | 234 | 120 | 92 | 22 | 0 | 22 |
| Pipeline contact damage inspections | 80 | N/A | N/A | 25 | 1 | 0 |
| Spill inspections | 653 | 611 | 23 | 19 | 0 | 0 |
| Waste management facilities | 54 | 27 | 23 | 4 | 0 | 16 |
| Drilling waste management | | | | | | |
| -Nonroutine inspections | 86 | 65 | 20 | 1 | 0 | 0 |
| -Routine inspections | 179 | 125 | 40 | 14 | 0 | 0 |
| TOTAL | 8 407 | 5 393 | 2 090 | 360 | 11 | 2 129 |

[1] For definitions of minor, major, and serious unsatisfactory inspections, see Section 1.3. Note that details for each inspection category are found in various sections throughout this report.

[3] An initial inspection is the first inspection on a facility in a designated time period.

[4] A reinspection is a follow-up to a deficiency found at a facility during the initial inspection.

This enforcement process

- improves EUB staff consistency, efficiency, and effectiveness;
- results in increased public safety, minimizes environmental impact, and improves conservation;
- helps create a level regulatory playing field for industry; and
- improves EUB and industry accountability.

Companies that fail to meet requirements or follow EUB direction are subject to escalating enforcement consequences. A company's required response to EUB direction and subsequent continued compliance with regulations result in its compliance status reverting back to satisfactory.

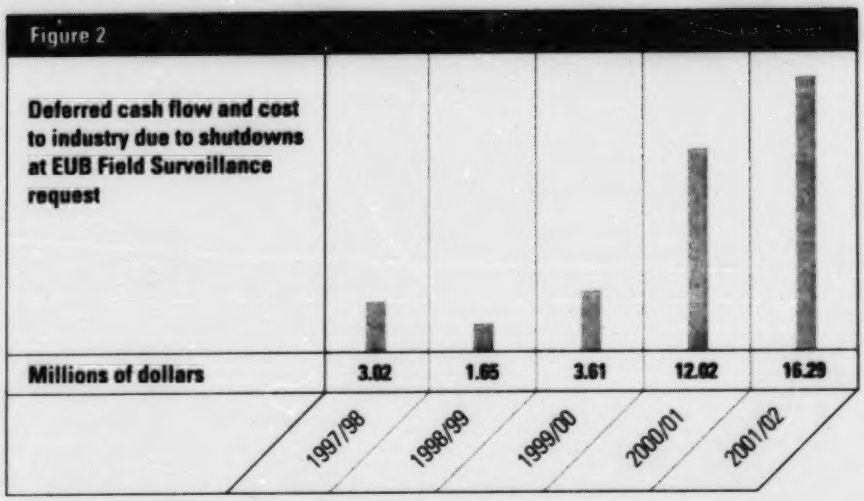
Table 2 summarizes the oil and gas operations that were shut down in 2001/2002 as a direct result of EUB enforcement action and the estimated cost to industry (also see Figure 2).

**Table 2. Facilities/operations shut down at EUB Field Surveillance request, April 1, 2001, to March 31, 2002**

| Type | Approximate number of suspensions | Average duration of shutdown | Estimated deferred cash flow[1] ($) | Estimated cost ($) | Most common reasons for suspensions |
|---|---|---|---|---|---|
| Drilling rigs | 19 | 9 hours | | 128 250 | • Operational failure of BOP/accumulator system<br>• Crew training |
| Service rigs | 7 | 18 hours | | 37 800 | • Operational failure of BOP/accumulator system |
| Oil production batteries | 51 | 39.3 days | 13 738 938 | | • Hydrogen sulphide ($H_2S$) emissions<br>• Spills |
| Gas facilities | 23 | 9.7 days | 589 683 | | • $H_2S$ emissions/excessive flaring |
| Pipelines under construction | 19 | 3.5 days | N/A | 275 000 | • Ground disturbance activities |
| Pipelines in operation | 23 | 15 days | 1 200 000 | 324 500 | • Corrosion integrity work |
| Subtotal | | | 15 528 621 | 765 550 | |
| **TOTAL** | **142** | | | **16 294 171** | |

[1] Compiled using data from EUB Field Centres. Where direct estimates were not available from the involved companies, cost estimates were as follows: $750/hour for drilling rig time; $300/hour for service rig time; $145/$m^3$ for value of conventional/bitumen oil production; $150/10^3 m^3$ for value of gas production; and $250/hour for pipeline construction down time. Costs of suspensions are as supplied by industry where available. Where necessary, costs were calculated using production reports.

Figure 2




## 1.5 Public Complaints

### 1.5.1 EUB Response to Public Complaints

Energy exploration and development activity remained high in 2001/2002. The EUB recognizes that with this activity level there will be associated public concerns. The EUB places a high priority on addressing these concerns effectively and efficiently.

Field Surveillance staff respond to all complaints within our jurisdiction. The focus is to ensure prompt, effective, and lasting resolution of any problem identified. However, when we receive a public complaint that is beyond the EUB's jurisdiction, the complainant is promptly directed to the appropriate government agency.

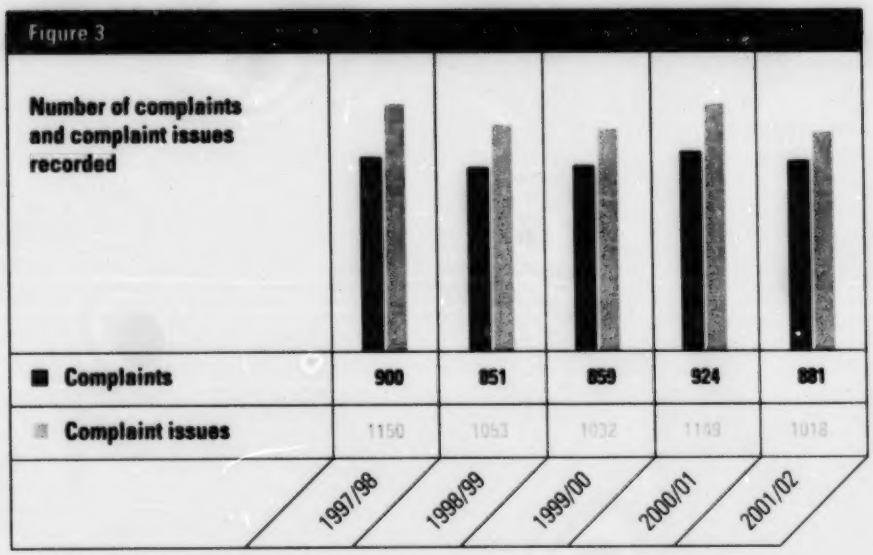
During 2001/2002, the EUB received and responded to 881 public complaints, compared to 924 in the previous year (decrease of 5 per cent). Since a number of complainants reported concerns about more than one issue, the EUB recorded 1018 issues associated with the 881 complaints, as compared to the 1149 issues identified last year (decrease of 12 per cent) (see Figure 3).

***EUB Action***

- The EUB will continue to emphasize the benefits and importance to industry of good communication with the public. The goal is to reduce the number of complaints and ensure lasting compliance.

- The number of complaints decreased compared to last year. The EUB expects the number of complaints to continue to decrease over time, due in part to our efforts in public/industry facilitation, industry's improved complaint response and communication procedures, and increased involvement of synergy groups.

Figure 3




### 1.5.2 Complaint Follow-up

Field Surveillance has a random complaint call-back program to determine the complainant's level of satisfaction with both EUB and industry responses. This information is analyzed to identify if appropriate complaint response procedures are being used by the EUB and industry.

Results of the Complaint Call-Back Survey indicate that in 2001/2002

- 69 per cent of incidents were resolved to the satisfaction of the complainants, compared to 65 per cent in 2000/2001;
- 62 per cent of the complainants were satisfied with the company response, compared to 66 per cent in 2000/2001; and
- 90 per cent of the complainants were satisfied with the response from the EUB, compared to 87 per cent in 2000/2001.

***EUB Action***

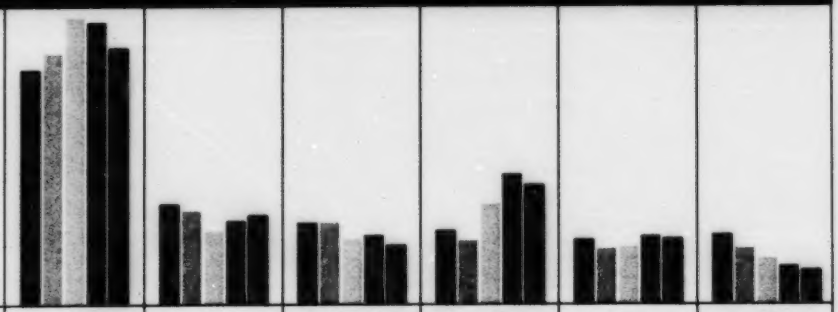
- The EUB is concerned with complainants' overall level of satisfaction with both industry and the EUB. Field Surveillance will continue to investigate ways to improve customer satisfaction.
- In 2002/2003, the EUB will target 300 complainants for follow-up to ensure that the EUB and industry are working effectively with our customers.

### 1.5.3 Types of Public Complaints

The EUB receives complaints on a variety of issues. Four of the most common issues are odours, property/lease management, flaring/smoke, and noise associated with upstream petroleum facilities (see Figure 4). Odour complaints represent 36 per cent of all public complaints received by the EUB in 2001/2002.

Figure 4

**Distribution of complaints by most common issues**



| | Odours | Lease management | Public health and safety | Flare/smoke | Noise | Spills |
|---|---|---|---|---|---|---|
| **1997/98** | **336** | **143** | **116** | **105** | **92** | **99** |
| **1998/99** | 360 | 134 | 117 | 91 | 79 | 80 |
| **1999/00** | 412 | 105 | 94 | 144 | 83 | 66 |
| **2000/01** | 405 | 120 | 99 | 186 | 98 | 55 |
| **2001/02** | **357** | **127** | **84** | **170** | **93** | **48** |

Although the activity level in the oil and gas industry remained high, the number of public complaints received by the EUB decreased marginally in most categories compared to last year. Reductions in public complaints can be attributed to several factors, such as increased surveillance, application of the enforcement ladders, and enhanced interaction with the public and industry through frontline stakeholder awareness work, including public meetings, synergy group participation, and educational presentations.

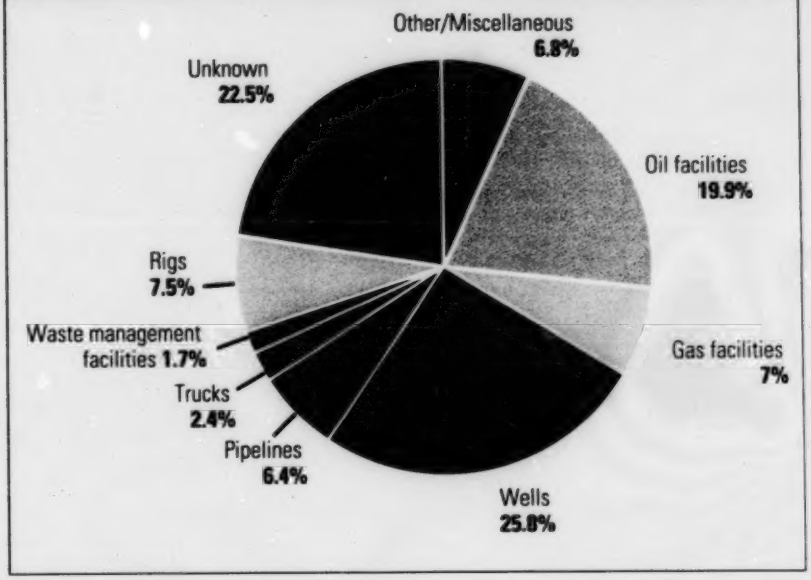
Analysis of public complaints indicates that wells and oil facilities were the largest sources of categorized public complaints, at 45.7 per cent (see Figure 5).

***EUB Action***

- Although the reduction in odour complaints (see Figure 4) is an improvement, the EUB views fugitive odours as unacceptable. The EUB expects operators to continually monitor their operations, improve equipment as new technology becomes available, properly maintain equipment, and focus on operational practices in an effort to eliminate fugitive emissions. The EUB will focus on increased inspections, increase mobile air monitoring, further education and awareness, and, when necessary, escalating consequences to ensure that operators address operational problems to continue to reduce the high number of public complaints.

- Ongoing communication with industry groups and associations on the most common sources and causes of public complaints and measures required to reduce them will continue in 2002/2003.

Figure 5. Public complaints by source, 2001/2002




## 1.6 Stakeholder Involvement Activities

### 1.6.1 Facilitation Efforts

It is industry's responsibility to discuss proposed development projects with affected citizens and identify and address concerns, with limited EUB staff involvement. When issues or concerns arise that have not been resolved satisfactorily, EUB field staff are available to assist in bringing the parties together to

- discuss concerns regarding the proposed development,
- assist the public in understanding what the EUB requirements of industry are,
- facilitate the discussion of possible solutions,
- assist the public in understanding what areas are within the EUB's mandate, and
- ensure understanding of the EUB's Appropriate Dispute Resolution (ADR) program and hearing process, which are available to both parties.

In 2001/2002, EUB field staff spent 400 days on facilitation efforts. Field staff were involved with 142 facilitations, of which 76 were successfully resolved and only 3 required a hearing. Facilitation efforts and third-party mediation continue on the remaining 63. These figures compare to 289 days spent on facilitation and 105 successfully resolved facilitations in 2000/2001.

***EUB Action***

- Significant training continued for EUB field staff in 2001/2002. This training, for both existing and new staff, improves staff effectiveness in facilitation and understanding of ADR.

- ADR is an option available to stakeholders for both applications and operational disputes. EUB staff will participate in this process upon request.

- Numerous presentations, meetings, and workshops have taken place to improve stakeholder understanding of ADR, which has proven very effective in assisting industry and the public in resolving issues. Results in 2001 include 30 third-party mediations, with 19 conflicts being successfully resolved and 4 requiring a hearing. Mediation is ongoing for the remaining 7.

### 1.6.2 Synergy Groups

Synergy groups have proven to be another effective way to deal with issues and concerns. These groups are usually made up of public, industry, and government representatives. The size, structure, and membership of the synergy group depend on factors such as population, production type, industry activity, geographical location, and sensitivity of an area. Currently, EUB field staff participate in most of these groups and strongly endorse this cooperative approach to improve communication and address issues. Table 3 lists 57 active synergy groups located throughout the province.

In February 2002, the EUB, the Canadian Association of Petroleum Producers (CAPP), and industry and community representatives organized a conference to share experiences and learn from synergy group participants throughout the province. The two-day conference was held in Red Deer and drew 248 participants, including those from 28 synergy groups and 51 oil and gas companies, as well as 38 EUB staff, including 5 Board Members and the EUB Chairman.

***EUB Action***

- Synergy groups are very effective in improving communication and resolving issues. The EUB will continue to recommend, endorse, and participate with synergy groups where appropriate.

- Since the feedback from the synergy group conference was positive, it is likely that future "synergy" conferences will take place. If so, EUB staff will continue to participate and support this approach as an effective way to improve communication with all of our stakeholders.

### 1.6.3 EUB Open Houses

EUB open houses were held in High Level, Midnapore, Rocky Mountain House, and Pincher Creek in 2001/2002. Total attendances at these open houses were 55, 100, 175, and 110 respectively. The purpose of an open house is to

- communicate important EUB processes and policies,

- improve working relationships with stakeholders, and

- provide an opportunity for stakeholders to ask questions, express concerns, and solicit solutions to issues.

Open houses also offer attendees the opportunity to acquire information about the EUB and to discuss any issues they have with local Field Centre staff, EUB management, and Board Members. A variety of information is available through displays, handouts, and

**Table 3. Active synergy groups in Alberta**

**Bonnyville Field Centre**
- Alberta Utility Location and Coordination Council
- Lakeland Industry & Community Association (LICA)
- Lakeland Truckers Committee
- Wood Buffalo Environmental Association

**Grande Prairie Field Centre**
- Chinchaga Operators Synergy
- Clear Hills Surface Rights Association
- County Industrial Operators Group
- Fourth Creek Group
- Greater Kakwa Area Citizens Group
- Hay/Zama Committee
- Peace Air Shed Zone
- Peace Arch Operators Group
- Rainbow Lake Operators
- Saddle Hills Awareness Group
- SPCA Beaverlodge Crime Prevention
- Valleyview Operators Group
- Western Cree Tribal Council

**Medicine Hat Field Centre**
- Grassland Naturalists
- Shallow Gas Management Association
- Urban Environment and Recreation Advisory Board

**Red Deer Field Centre**
- Bashaw Community Advisory Group
- Butte Advisory Committee
- Caroline BHL "B" Pool Advisory Committee
- Eagle Valley Community Advisory Group
- Harmattan Elkton Community Advisory Committee
- Olds Community Advisory Group
- Parkland Airshed Management Zone (PAMZ)
- Sundre Petroleum Operator's Group (SPOG)
- Strachan Mutual Aid Group
- Sunchild/Ochiese Mutual Aid Group

**Drayton Valley Field Centre**
- Edson Creative Solutions
- Genesee Synergy Group
- Pembina Area Natural Resources Advisory Committee (PANRAC)
- Rider Pembina Advisory Committee
- West Central Air Shed Society

**Midnapore Field Centre**
- Airdrie Public Petroleum Producers Awareness Alliance (APA)
- Cochrane Pipeline Operators Committee
- Indus
- Okotoks (Nexen) Plant Site Reclamation Committee
- Quirk Creek Gas Processing Community Committee
- Shell Waterton Environment Round Table
- Vulcan Synergy Group
- Williams & Cochrane Area Public Group

**St. Albert Field Centre**
- East Parkland Liaison Committee (EPLC)
- Edmonton Area Pipeline Utilities Operators Committee (EAPUOC)
- Fort Air Partnership
- Northeast Central Industrial Association
- Redwater Public/Industry
- Rimbey and Area Multi Stakeholders Group
- Watelet Public/Industry
- West Edmonton Operators Group

**Wainwright Field Centre**
- Alliance/Brownfield Operators
- Hardisty Pipeline Terminal Committee
- Lloydminster Area Gas Conservation Committee
- Lloydminster Area Operators Gas Migration Team (LAOGMT)
- Provost Area Operators
- SaskAlta Oil Sands Producers

one-on-one discussions. Open houses include presentations on key processes and policies, with a panel to hear and respond to issues and concerns.

The EUB will continue to host open houses as long as the need exists. Feedback to date indicates that attendees find them worthwhile and effective.

***EUB Action***

- In 2002/2003, open houses are scheduled for Bonnyville (June), Medicine Hat (November), and Sundre (spring 2003). The EUB will continue to measure the effectiveness of these open houses and make improvements as necessary.

## 1.7 Major Initiatives

### 1.7.1 Advisory Committee on Public Safety and Sour Gas

In January 2000, the EUB established the Advisory Committee on Public Safety and Sour Gas. The 22-member multistakeholder committee was asked to review the regulatory system for sour gas as it relates to public health and safety. More than 1600 Albertans residing in major sour gas development areas in the province were consulted through public outreach sessions, written submissions, and telephone surveys.

A report containing 87 specific recommendations was published with recommendations directed at

- improving understanding of sour gas,
- improving regulatory processes under which sour gas development is approved and operates,
- reducing the impact of sour gas on public health and safety, and
- improving consultation with the public on all sour gas matters.

Of the 87 recommendations, 12 are directly related to Field Surveillance processes. A total of 8 recommendations were acted on in 2001/2002. The following is a brief description of these 8 recommendations, with the follow-up action taken:

- Recommendation 15 – Improve the EUB's follow-up on major releases of sour gas.

  Action Taken – A documented process was developed to ensure timely EUB response, investigation, enforcement, and follow-up of upstream petroleum incidents, including sour gas releases.

- Recommendation 25 – The EUB increase the frequency of inspections and audits on sour gas operations that have EUB-approved emergency response plans (ERPs) and inform nearby residents of results.

  Action Taken – The inspection frequency was increased on sour facilities with ERPs, as follows:
  - sour gas plants with sulphur recovery – inspection cycle increased from a 3-year cycle to a 2-year cycle;
  - sour gas plants with acid gas flares – inspection cycle increased from a 5-year cycle to a 3-year cycle; and
  - sour oil batteries with ERPs – inspection cycle increased from a 5-year cycle to a 2-year cycle.

  In addition, a resident contact form was developed to assist field staff in determining whether residents within the ERP zone are aware of and understand the ERP requirements. Inspection results are discussed with the public at the same time.

- Recommendation 26 – The EUB increase its inspection frequency of new and non-compliant operators at sour gas facilities.

Action Taken – Field Surveillance increased the priority of new and noncompliant operators, which will increase the number of inspections conducted on these facilities. To support this effort, two additional field inspectors have been hired.

- Recommendation 27 – The EUB inspect all critical sour wells located near people, inform nearby residents of the inspection results, and ensure they are aware of and understand the ERP.

  Action Taken –Field Surveillance has increased the inspection frequency on critical sour wells to 100 per cent and uses the resident contact form to determine whether residents within the ERP zone are aware of and understand the ERP requirements.

- Recommendation 28 – The EUB give highest priority to sour gas complaints and ensure timely and appropriate investigation and follow-up with the complainant.

  Action Taken – Field Surveillance staff will investigate all sour gas related complaints and inform the complainants of the investigation results. To gauge the EUB's and industry's complaint-handling effectiveness, complainants are randomly contacted through a "complaint call-back" process (see Section 1.5.2 for results).

- Recommendation 29 – The EUB field staff become more involved in landowner/ industry discussions of sour gas concerns and in multistakeholder groups to assist in answering questions and resolving issues related to public safety and sour gas.

  Action Taken – Field staff are more involved in the resolution of issues by facilitating discussions between landowners and industry and through the ADR program (see Section 1.6.1). In addition, the EUB is active in promoting the development of synergy groups and increasing its visibility through open house activities (see Sections 1.6.2 and 1.6.3).

- Recommendation 68 – The EUB improve its capability to conduct mobile air monitoring as part of its complaint response and compliance program.

  Action Taken – The EUB's existing monitoring equipment was upgraded and an additional air-monitoring unit was purchased and put into service. Both units will be conducting routine air-monitoring activities and responding to odour complaints near sour gas facilities.

- Recommendation 85 – The EUB ensure First Nation and Metis communities near sour gas developments are aware of the EUB's complaint and incident response program.

  Action Taken – The EUB initiated an extensive training program to enhance staff awareness and understanding of First Nation and Metis cultures. In addition, the EUB is meeting with First Nation and Metis communities to improve their understanding of oil and gas operations and the roles and responsibilities of the EUB and Indian Oil & Gas Canada (IOGC), including complaint and incident response.

More detailed information on the Advisory Committee on Public Safety and Sour Gas is available on the EUB's Web site at <www.eub.gov.ab.ca>.

*EUB Action*

- Of the remaining four Public Safety and Sour Gas initiatives, one will be completed in 2002/2003, and the other three are scheduled for completion the following year.

### 1.7.2 A New EUB Application Registry (IAR)

The EUB has a new registry for energy and utility applications, which provides any interested party with computer Internet access information on any application registered with the EUB. This registry will improve the communication regarding our application process by providing more timely information about proposed energy and utility developments. Additional information on the new application registry is in *General Bulletin (GB) 2001-21: A New EUB Application Registry* and on our Web site at <www.eub.gov.ab.ca>.

### 1.7.3 New Computerized Field Inspection System for Field Surveillance Branch

The EUB Field Surveillance Branch is currently developing a new computerized field inspection system (FIS), which will reflect current business practices and processes using an automated and integrated approach to field inspection activities and record management. This is a three-phase project to be completed in 2003 and will result in

- automation of most industry notifications,
- automation of the prioritized inspection process (OSI),
- improved accuracy of information,
- enhancement of the enforcement process,
- automation of key statistics and measures, and
- improved data retrieval and analysis capability.

More information on FIS can be found in *GB 2001-19: New Field Inspection System for EUB Field Surveillance Branch.*

## 1.8 Significant Events

### 1.8.1 BP Fort Saskatchewan

On August 26, 2001, an uncontrolled release occurred from an ethane storage cavern at BP Canada Natural Gas Liquids Plant, located 6 kilometres (km) northeast of Fort Saskatchewan. Approximately two hours after the release occurred, the ethane gas ignited, due to contact with electricity from overhead power lines. The fire was contained entirely on site and there was no threat to public safety. On September 3, 2001, nine days later, the escaping ethane was contained and the fire extinguished.

The cause of the incident was the failure of an elbow on a 2-inch line connecting two wellheads that service the ethane storage cavern. The EUB investigation determined that unusual transverse defects caused the elbow to fail and that these defects were not detectable through conventional testing methods.

There were no injuries to any public or incident response personnel and no property damage outside of the plant site; the environmental impact was minimal.

### 1.8.2 Barrington Shekilie

On June 11, 2001, an uncontrolled release of sour gas occurred on a suspended sour well located in the Shekilie region (5-31-116-10W6). The well is in a remote, unpopulated region approximately 32 km northwest of Zama Lake.

The remoteness and inaccessibility presented unique challenges in responding to the emergency and subsequent well control operations. A decision to ignite the flow from the well was made when well control efforts and worker safety were hampered. The well was brought under control on July 11, 2001.

Final well abandonment was completed on February 3, 2002.

# 2 Drilling and Servicing

## 2.1 Introduction

The EUB is responsible for the regulation of drilling and servicing operations to ensure public safety, conservation of resources, and protection of the environment. This responsibility is accomplished through existing regulations and requirements, which include conducting inspections, monitoring operator and contractor performance, evaluating incidents, and applying fair and firm enforcement action in cases of noncompliance.

## 2.2 Well Control Occurrences

The EUB collects key well control occurrence data. This information assists the EUB in monitoring industry performance and identifies when changes to regulations, inspection procedures, or operating practices may be required.

Primary indicators of industry's drilling and servicing performance include the number of blows, blowouts, and kicks and industry's response to these incidents.

### 2.2.1 Drilling—Blows/Blowouts/Kicks

During the drilling of 14 307 wells in 2001/2002, two blowouts[5] and one blow[6] occurred (see Table 4). The two blowouts occurred in the first stage of drilling, when no surface pipe or blowout preventers are in place. One of the blowouts was a freshwater flow,

[5] The complete loss of control of the flow of fluids (gas, oil, water, mud) from a well. Control can only be regained by installing or replacing equipment to permit shut-in or killing the well or by drilling a relief well.

[6] The unexpected release of wellbore fluids (gas, oil, water, mud) to the atmosphere. The flow can be controlled almost immediately by shutting in the well by using wellhead valves or blowout prevention equipment or by directing the flow to the flare system until the well is killed.

Table 4. Drilling and servicing well control occurrences, 2001/2002

| | Drilling | Servicing |
|---|---|---|
| Blowouts | 2 | 6 |
| Blows | 1 | 1 |
| Kicks | 112 | N/A |

while the other was a sweet gas and freshwater flow. Both blowouts and the sweet gas blow were of short duration and resulted in minimal environmental damage.

In 2001/2002 there were 112 kicks[7] recorded. This equates to a kick occurrence rate of approximately 8 kicks per 1000 wells drilled. The kick occurrence rate has remained relatively constant for the last five years and is a significant improvement from the years prior to 1997/1998, when the kick occurrence rate averaged 23 kicks per 1000 wells drilled.

### 2.2.2 Servicing—Blows/Blowouts

In well servicing operations, a total of six blowouts and one blow occurred in 2001/2002 (see Table 4). Four of the blowouts and the one blow were sweet gas releases. Both of the remaining two blowouts resulted in a release of sour gas, with one of the blowouts incurring significant equipment loss. All blowouts and the one blow were successfully brought under control with minimal environmental damage.

*EUB Action*

- The EUB will review all blows and blowouts related to drilling and servicing operations to identify changes to equipment, procedures, or regulations that may be required to reduce drilling and servicing blows and blowouts.

- The EUB expects industry to maintain high training standards for rig personnel in well control and crew training. These will continue to be high-priority inspection areas for EUB staff.

## 2.3 Drilling— Activity Levels, Inspections, and Inventory

2001/2002 was another exceptionally busy year in the drilling industry, with a total of 14 307 new wells drilled. This compares to the record 14 621 wells drilled in Alberta during 2000/2001 (see Table 5).

The number of new wells drilled brings the total number of nonabandoned wells in Alberta to 158 945.

## 2.4 Drilling—Inspections

During 2001/2002, EUB field staff conducted 499 inspections on drilling operations, resulting in 448 satisfactory inspections (89.7 per cent) and 51 unsatisfactory inspections (10.3 per cent). All unsatisfactory items were brought into compliance. This is an

[7] During drilling operations, any unexpected entry of water, gas, oil, or other formation fluid into a wellbore that is under control and can be circulated out.

**Table 5. Alberta drilling activity and EUB inspection results**

| | 1997 | 1998 | 1999/00 | 2000/01 | 2001/02 |
|---|---|---|---|---|---|
| Wells drilled | 10 773 | 7 094 | 11 548 | 14 621 | 14 307 |
| Drilling rigs inspected | 421 | 696 | 631 | 648 | 499 |
| % inspected | 3.2 | 9.8 | 5.5 | 4.4 | 3.5 |
| % satisfactory | 79.0 | 85.0 | 87.1 | 87.7 | 89.7 |
| % unsatisfactory (total major and minor) | 21.0 | 15.0 | 12.9 | 12.3 | 10.3 |

improvement from 2000/2001, when 12.3 per cent of inspections were recorded as unsatisfactory.

***EUB Action***

- The EUB prioritizes all drilling rig inspections based on a point system that includes operator/contractor performance, site sensitivity, and inherent risk (OSI, see Section 1.3). The EUB will continue to use a priority inspection system that targets noncompliant operators and high-risk operations, such as sour and critical wells.

- EUB field staff will continue to hold meetings and make presentations to companies and drilling contractors to ensure that EUB regulations and requirements are understood.

- EUB field staff will continue to apply consistent enforcement action for noncompliance to increase industry awareness and accountability.

### 2.4.1 Drilling—Major/Serious Unsatisfactory Items

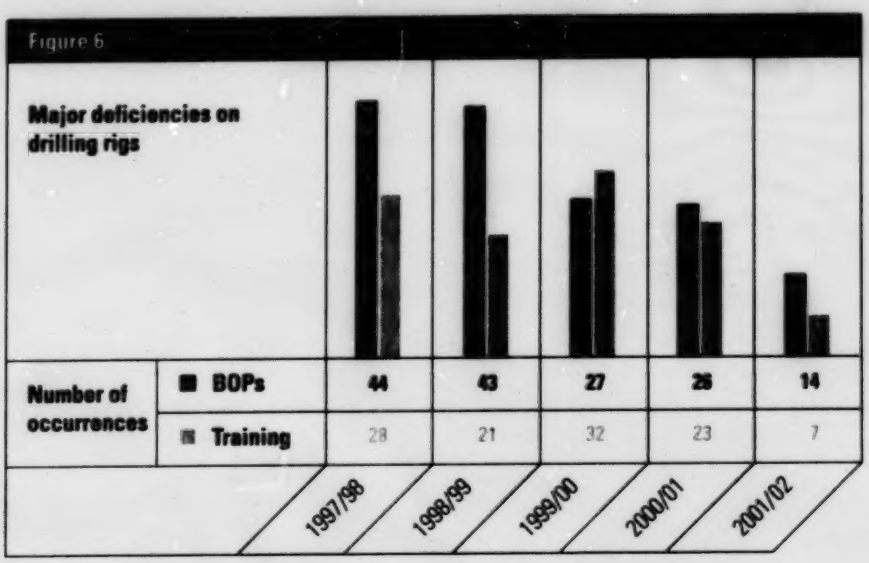
Of the 499 drilling inspections conducted in 2001/2002, 19 major unsatisfactory inspections resulted, with a total of 21 major unsatisfactory items being recorded (see Section 1.3 for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections). Operational failures of the BOP/accumulator systems resulted in 14 of the unsatisfactory items, while deficiencies in crew training accounted for the remaining 7 (see Figure 6). This was a significant improvement over 2000/2001, when 26 failures of the BOP/accumulator systems and 23 deficiencies in crew training were noted. There were no serious unsatisfactory inspections recorded in 2001/2002.

Drilling operations were suspended at all rigs with major unsatisfactory items until the deficiencies were corrected. This resulted in 19 shutdowns, totalling approximately 171 hours, compared to 2000/2001, when 41 rig shutdowns totalled 145 hours.

***EUB Action***

- The EUB will continue to take enforcement action for all unsatisfactory inspections, including suspending drilling operations when major or serious unsatisfactory items are noted.

Figure 6




## 2.5 Servicing—Activity Level

2001/2002 was an exceptionally busy year for well servicing activity in Alberta. This was in part due to the number of new wells drilled during the year.

### 2.5.1 Servicing—Inspections

In 2001/2002, EUB field staff conducted 262 inspections on well servicing operations, resulting in 237 satisfactory inspections (90.5 per cent) and 25 unsatisfactory inspections (9.5 per cent). All unsatisfactory items were brought into compliance. This compares to 348 inspections in 2000/2001, which resulted in 303 satisfactory inspections (87.1 per cent) and 45 unsatisfactory inspections (12.9 per cent).

### 2.5.2 Servicing—Major/Serious Unsatisfactory Items

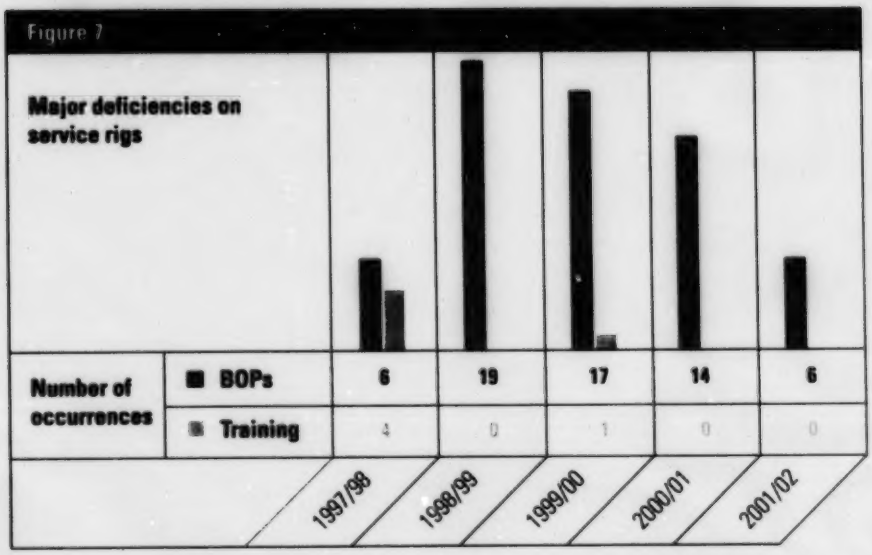
Of the 25 unsatisfactory inspections recorded in 2001/2002, 6 were major unsatisfactory inspections, with a total of 6 major unsatisfactory items noted. This compares to 14 major unsatisfactory inspections, with a total of 14 major deficiencies, noted in 2000/2001. Operational failures of the BOP/accumulator systems accounted for all of the major deficiencies recorded in 2001/2002 (see Figure 7), which is a significant improvement over 2000/2001, when 14 operational failures of the BOP/accumulator systems were noted. One serious unsatisfactory inspection recorded in 2001/2002 was due to an inadequate emergency response plan.

Servicing operations were suspended at all rigs with major/serious unsatisfactory items until the deficiencies were corrected. This resulted in 7 shutdowns, totalling 126 hours, compared to 2000/2001, when 14 rig shutdowns totalled 31 hours.

***EUB Action***

- EUB field staff will continue to hold meetings and make presentations to companies and well servicing contractors to ensure that EUB regulations and requirements are understood.

Figure 7




- The EUB will continue to take enforcement action for all unsatisfactory inspections, including suspending servicing operations when major or serious unsatisfactory items are noted.

## 2.6 Public Complaints—Drilling and Servicing

During 2001/2002, EUB field staff investigated 59 complaints related to the drilling and servicing of wells. The cause of the complaints varied and included such issues as noise, odours, and dust created by traffic.

***EUB Action***

- Public complaints are an EUB priority. The EUB will continue to investigate all public complaints related to the drilling and servicing of wells in Alberta and ensure that appropriate action is taken.

## 2.7 Inspection Manual Reviews—Drilling and Servicing

***EUB Action***

- The EUB is currently updating both *Guide 36: Drilling Rig Inspection Manual* and *Guide 37: Service Rig Inspection Manual*. The primary focus is to clarify EUB drilling and servicing requirements and make the guides more user friendly. Drafts of both guides are expected to be available in the fall of 2002 for stakeholder review.

# 3 Oil Production Facilities

## 3.1 Introduction

EUB staff spend significant time with companies conducting operator awareness sessions to increase their understanding of EUB requirements and the consequences for noncompliance. These sessions may include a review of EUB *Guide 64: Facilities Inspection Manual, Guide 60: Upstream Petroleum Industry Flaring Guide,* and *IL 99-4: EUB Enforcement Process, Generic Enforcement Ladder, and Field Surveillance Enforcement Ladder.*

EUB field staff also focus on companies with high minor unsatisfactory inspection rates, with the goal of improving their compliance record.

Significant resources are used to deal with public complaints associated with oil production facilities. Field staff work with industry to ensure that proper equipment is in place and regular maintenance occurs to minimize facility upsets that result in impacts on the public.

The EUB is evaluating its field presence in the commercial oil sands development in the Fort McMurray area. An EUB oil sands inspection guide is being developed, with completion targeted for March 2003.

## 3.2 Reduction in Potential Public Liabilities from Suspended and Derelict Facilities

In previous years EUB field staff focused their efforts on suspended facilities that had not produced for two or more years. Companies were requested to initiate abandonment if facilities were deemed uneconomic.

As part of the expanded orphan program, the EUB requires all upstream oil and gas facilities to be licensed. A retrospective facility licensing program was initiated to obtain an inventory of facility owners and working interest participants. The EUB, in

collaboration with the oil and gas industry, is developing screening criteria to assess the liability of individual licensees for well and facility abandonment and reclamation activities. When implemented, licensees that fail the assessment will be required to submit a security deposit to the EUB.

With the EUB Liability Management Program (LMP), fewer resources will be dedicated to inspect suspended facilities in 2002/2003.

***EUB Action***

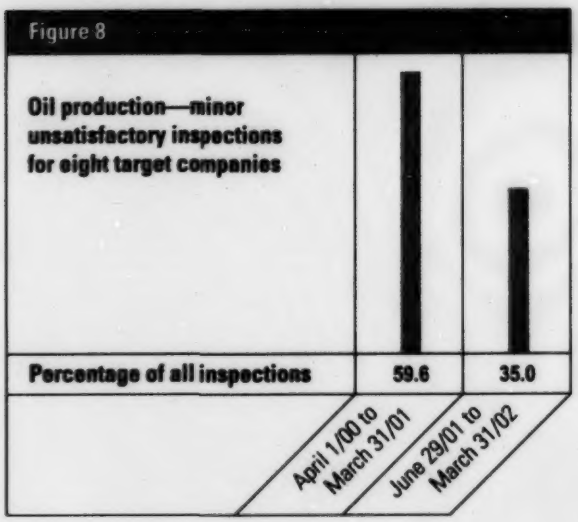
- The EUB will continue to work with the oil and gas industry to develop appropriate screening criteria and security deposit processes for implementation in 2002/2003. The security deposits will be used to address a licensee's abandonment and reclamation activities if the licensee is unable or unwilling to fulfill these obligations.

## 3.3 Companies with High Minor Unsatisfactory Inspection Rates

The process to identify companies with a minor unsatisfactory inspection rate that is significantly above the industry average is outlined in *IL 99-4: EUB Enforcement Process*. The EUB identified eight companies that had a minor unsatisfactory rate greater than 50 per cent, based on their inspection record for the period April 1, 2000, to March 31, 2001. EUB staff held meetings with each company to review its inspection record and required each company to develop an action plan to address its high minor unsatisfactory rate. The EUB outlined the escalating consequences that would occur if its inspection record did not show significant improvement upon a follow-up review in April 2002.

For the inspection period April 1, 2000, to March 31, 2001, the eight companies had a combined total of 460 initial inspections. Minor unsatisfactory conditions were found at 274 batteries, resulting in a 59.6 per cent unsatisfactory rate. The inspection record review of these eight companies from June 29, 2001, to March 31, 2002, indicated that of the 207 total initial inspections, minor unsatisfactory conditions were found at 83 batteries, resulting in a 35.0 per cent unsatisfactory rate (see Figure 8). This is a significant improvement in their compliance rate, and further improvements are expected as a result of the measures implemented by the companies.

Figure 8


Oil production—minor unsatisfactory inspections for eight target companies
Percentage of all inspections
59.6
35.0
April 1/00 to March 31/01
June 29/01 to March 31/02

Measures taken by these companies to improve their compliance rate included

- conducting independent third-party inspections and self-audits at their facilities and notifying the EUB of any noncompliant items;
- conducting meetings with trucking firms to inform them of the necessity of maintaining a clean operation;
- conducting meetings with company personnel and contract operators to ensure that they are aware of EUB requirements; and
- including the company's EUB inspection results in the criteria for setting employee bonuses.

***EUB Action***

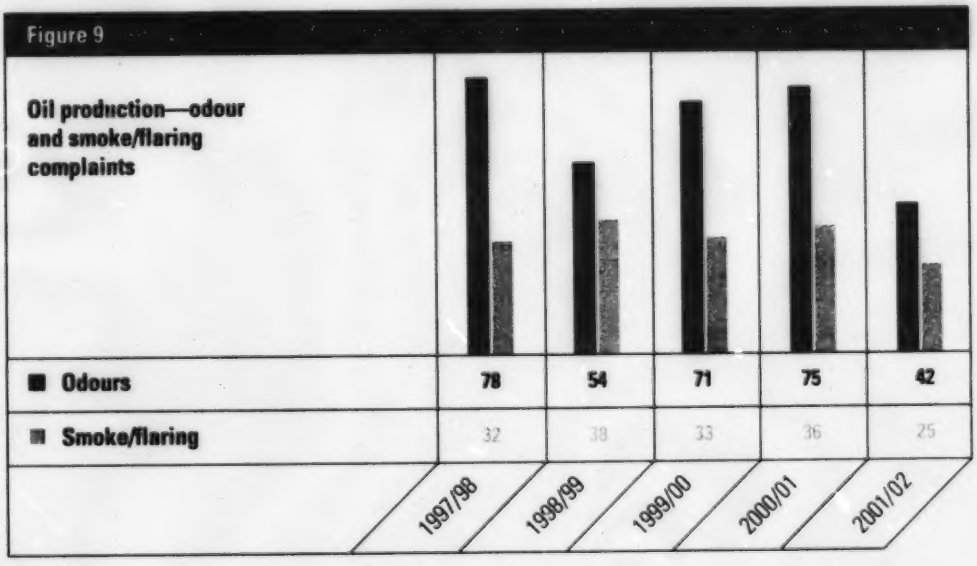
- The EUB will focus on companies that clearly exceed the minor unsatisfactory industry average. Companies will be required to submit a written action plan to address noncompliant items at similar facilities they operate throughout the province. If future EUB inspections indicate that they are continuing to exceed the minor unsatisfactory industry average, consequences may be elevated to third-party inspections at the company's expense and/or full or partial suspensions, as directed by the EUB.

## 3.4 Public Complaints

During 2001/2002, EUB Field Centres investigated 67 public complaints related to odours and smoke/flaring at oil production facilities, compared to 111 similar complaints in 2000/2001 (see Figure 9). This significant reduction is attributed to companies' compliance with *Guide 60: Upstream Petroleum Industry Flaring Requirements* and their proactive measures to reduce fugitive emissions.

Figure 9

**Oil production—odour and smoke/flaring complaints**



Each year the EUB reviews the public complaint history of each oil production facility to determine if there were repeat complaints. If so, EUB field staff determine whether additional regulatory or industry action is required to achieve lasting improvement.

In the 2001/2002 reporting year, 15 oil facilities were identified as having repeat public complaints; this compares to 19 oil facilities with repeat complaints in 2000/2001. The public complaints were related to odours, smoke/flaring, noise, spills, and lease management.

***EUB Action***

- The EUB will continue to ensure that operators investigate sources of emissions, install new equipment, utilize modern technology to reduce emissions, continuously monitor operations, and improve communications with area residents.

- The EUB has increased the inspection frequency at sour facilities that have had major or serious unsatisfactory inspections.

## 3.5 Inventory, Activity Level, and Inspections

The current inventory of conventional oil and crude bitumen batteries/satellites has increased from previous years and is as follows:

- sweet multiwell 1543
- sour multiwell 657
- sweet single well 8110
- sour single well 1248
- sweet satellites 2935
- sour satellites 1418

Figure 10 shows the inventory of oil batteries and associated satellites, the number of battery/satellite inspections, and the percentage found to be satisfactory for the years 1997/1998 to 2001/2002 (see Section 1.3 for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections). The battery and satellite inspections conducted in 2001/2002 had a 64.0 per cent satisfactory inspection rate, an improvement over the previous year's satisfactory inspection rate.

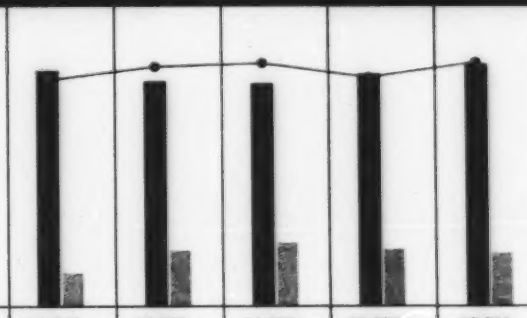
Using the OSI[8] priority inspection process, EUB staff conducted 3562 battery and satellite inspections in 2001/2002. This compares to the previous year, when 3794 inspections were conducted.

There were 137 major unsatisfactory inspections and 7 serious unsatisfactory inspections in 2001/2002. As a result of major/serious unsatisfactory inspections, 51 oil production facilities were suspended. Appropriate enforcement action was taken on the remaining to

[8] As stated in Section 1.3, the EUB conducts inspections based on priority selection criteria that include **operator**/contractor performance history, site **sensitivity**, and **inherent** risk of the operation (OSI).

Figure 10

**Oil production—inventory, battery/satellite inspections, and percentage satisfactory**



| | 1997/98 | 1998/99 | 1999/00 | 2000/01 | 2001/02 |
|---|---|---|---|---|---|
| Inventory | 15 500 | 14 787 | 14 634 | 15 261 | 15 911 |
| Battery/satellite inspections | 2 269 | 3 727 | 4 235 | 3 794 | 3 562 |
| Percentage satisfactory | 59.5 | 63.0 | 63.9 | 60.2 | 64.0 |

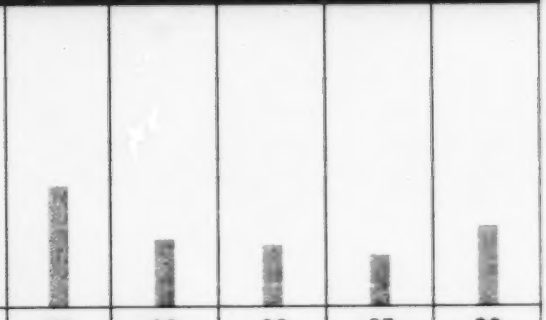
bring those facilities into compliance. This compares with 96 major/serious unsatisfactory conditions identified in the 3794 inspections conducted in 2000/2001.

The increase in major/serious unsatisfactory inspections is attributed to a zero-tolerance approach by EUB Field Surveillance staff for off-lease hydrogen sulphide ($H_2S$) emissions and also the commissioning and use of a second mobile air-monitoring unit.

Figure 11 shows the percentage of battery/satellite inspections with major/serious unsatisfactory inspections since 1997/1998.

Figure 11

**Battery/satellite inspections with major/serious unsatisfactory inspection items**

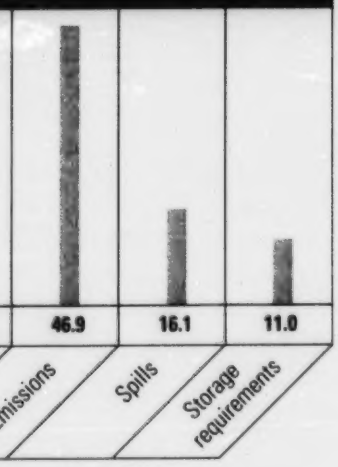


| | 1997/98 | 1998/99 | 1999/00 | 2000/01 | 2001/02 |
|---|---|---|---|---|---|
| Percentage | 5.9 | 3.3 | 3.0 | 2.5 | 3.9 |

The three most common major/serious unsatisfactory inspection items found in 2001/2002 are shown in Figure 12.

Figure 12

**Oil facilities' three most common major/serious unsatisfactory inspection items, 2001/2002**




The most common major/serious unsatisfactory inspection items are

- equipment failure resulting in $H_2S$ emissions off lease;
- operator not appropriately cleaning up spills; and
- no dike installed around the production tanks, resulting in inadequate secondary containment.

***EUB Action***

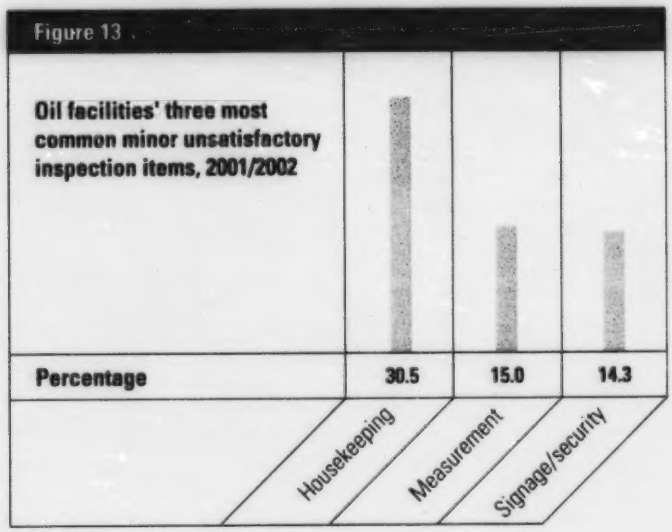
- Major/serious unsatisfactory inspections will be dealt with as outlined in *IL 99-4: EUB Enforcement Process*. Consequences include
  - suspension of operations where necessary to alleviate impact;
  - company instructed to take corrective action at subject site and ensure compliance at all similar facilities that it operates provincially;
  - documented action plan required to ensure that the issue or event does not recur or is minimized.
- The EUB will focus on oil facilities that require site-specific emergency response plans. The inspections will include contacting residents within the emergency planning zone to ensure that they are aware of and understand the ERP requirements.
- The EUB will increase mobile air-monitoring inspections at sour facilities in 2002/2003.
- The EUB will continue to meet with industry to discuss inspection results, focusing on identifying the most common unsatisfactory items and finding solutions to improve industry compliance.

Minor unsatisfactory conditions were found in 1145 of the 3562 inspections (32.0 per cent) in 2001/2002. All unsatisfactory inspection items were brought into compliance. This compares with 1413 minor unsatisfactory conditions in 3794 inspections (37.2 per cent) for the previous year. The most common minor unsatisfactory items found in 2001/2002, shown in Figure 13, were

- housekeeping
  - garbage and debris not stored properly
  - oil-stained areas on lease not cleaned up
- measurement
  - meter calibration expired
- signage/security
  - no identification or warning signs posted
  - fencing not adequate

Figure 13

**Oil facilities' three most common minor unsatisfactory inspection items, 2001/2002**




***EUB Action***

- Minor unsatisfactory inspections will be dealt with as outlined in *IL 99-4: EUB Enforcement Process.*

## 3.6 Commercial Oil Sands Initiative

The EUB is evaluating its presence in commercial oil sands development near Fort McMurray. Field Surveillance is participating in this evaluation, which is expected to be complete within the next few months.

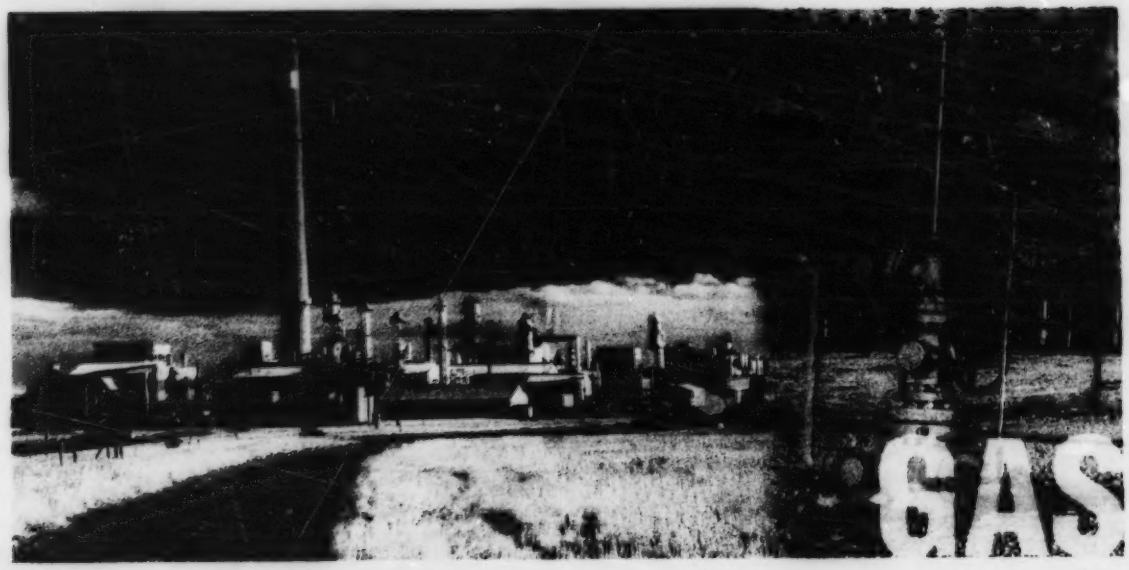
***EUB Action***

- An action plan will be developed and presented to the EUB Board for approval.

## 3.7 Inspection Manual Review

***EUB Action***

- *Guide 64: Facility Inspection Manual* has been revised and updated. The new edition will be released in mid-2002.




# 4 Gas Production

## 4.1 Introduction

The EUB has a provincial inspection program that integrates a general plant inspection with a more detailed assessment of environmental and public-related issues. This operational audit process reviews items such as emergency response preparedness, flare measurement and control, tank storage requirements, and waste management programs.

In addition, the EUB has a surveillance program that encourages industry to reduce flaring at gas processing facilities. Companies with gas plants flaring more than 0.5 per cent of the total annual volume delivered to the plant are required to submit a plan outlining actions to reduce reported flare volumes.

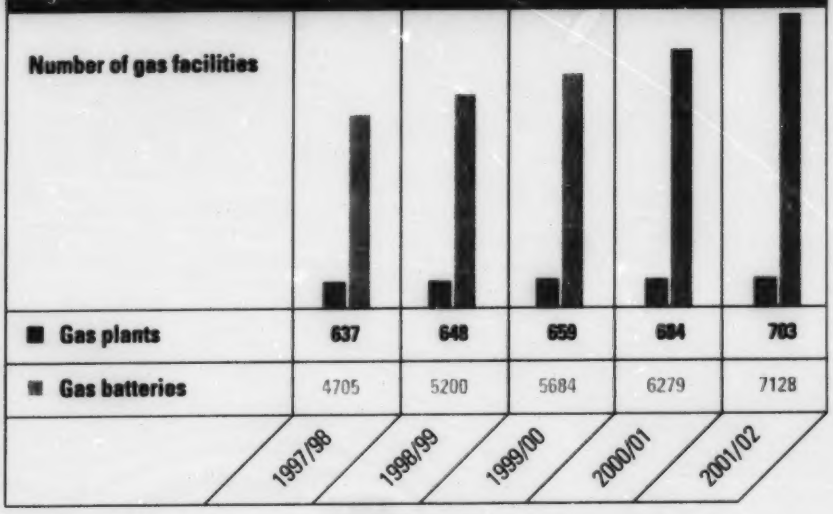
EUB staff spent a significant amount of time assisting in resolving issues related to proposed and existing gas processing facilities. Field staff were involved in open houses, information sessions, industry and community meetings, and synergy groups in an effort to alleviate public concerns and improve industry awareness of the impact these facilities have on surrounding communities.

## 4.2 Inventory, Activity Level, and Inspections

Record activity levels in the natural gas industry led to an increase of 7708 producing gas wells in 2001/2002, compared to 7297 new gas wells last year. At year end, there were 64 814 producing gas wells in Alberta. As a result, the number of single- and multiwell gas batteries increased significantly from the previous year (see Figure 14).

The number of gas plants has increased slightly, as shown in Figure 14. There are 456 sweet gas plants and 247 sour gas plants operating in the province, including 47 sulphur recovery gas plants and 29 sour gas plants with acid gas injection schemes. The

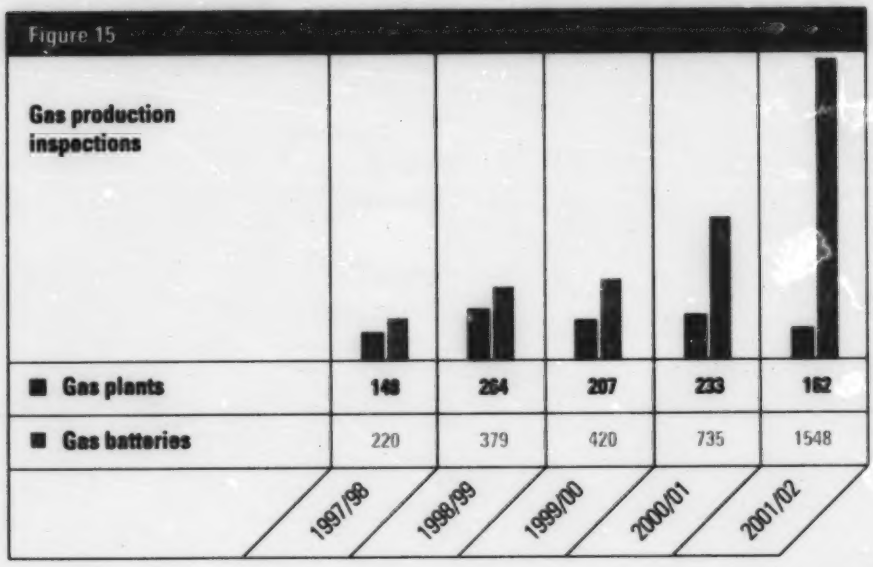
Figure 14




emergence of midstream[9] companies has led to the creation of a pipeline infrastructure connecting most of the larger gas processing facilities in western Alberta. A large portion of new gas production in 2001/2002 was tied into this infrastructure, providing increased utilization of existing processing capacity and a reduction in new gas processing facility construction.

There were 1778 initial inspections completed on gas processing facilities in 2001/2002, representing a substantial increase in inspection levels from 2000/2001, when 968 inspections were conducted (see Figure 15). In 2001/2002 EUB field staff conducted 122

Figure 15




[9] Midstream companies are in the business of providing gathering and processing services to the upstream petroleum industry.

inspections of well test flaring operations to ensure compliance with EUB *Guide 60: Upstream Petroleum Industry Flaring Guide*. This compares to 72 inspections conducted in the previous year.

***EUB Action***

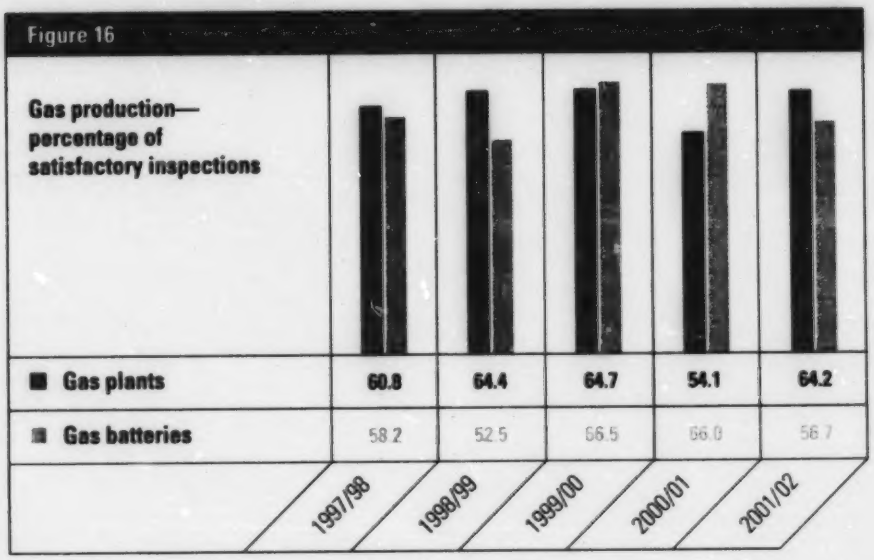
- The EUB will continue to adjust its gas processing facility inspection levels as necessary to ensure continued improvement in the level of compliance.

## 4.3 Compliance Levels

The satisfactory initial inspection rate for gas batteries decreased from 66.0 per cent in 2000/2001 to 58.7 per cent in 2001/2002. (See Section 1.3 for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections.) However, the satisfactory initial inspection rate for gas plants increased from 54.1 per cent in 2000/2001 to 64.2 per cent in 2001/2002 (see Figure 16). The percentage of satisfactory follow-up inspections increased in 2001/2002 (see Figure 17), indicating that industry understands the consequences of continued noncompliance.

Figure 16

**Gas production—percentage of satisfactory inspections**




EUB staff completed 17 operational audits of gas processing facilities in 2001/2002. Of these, 8 had satisfactory inspections, 8 had minor unsatisfactory inspections, and 1 had a major unsatisfactory inspection. There were no serious unsatisfactory inspections. All facilities were brought into compliance.

Major unsatisfactory inspections accounted for 4.2 per cent of all gas processing facility inspections completed in 2001/2002 (see Figure 18), compared to 3 per cent in 2000/2001. One serious unsatisfactory inspection was recorded in 2001/2002. Of all major unsatisfactory inspections, 89 per cent originated at single- and multiwell gas batteries (gas well installation and compressor stations). EUB field staff suspended 23 facilities until improvements were made to ensure that the facilities operated with minimal impact.

Figure 17

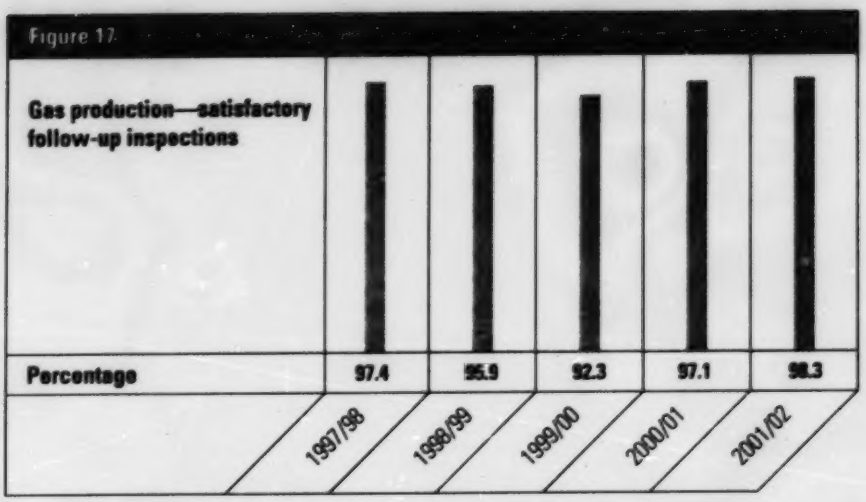
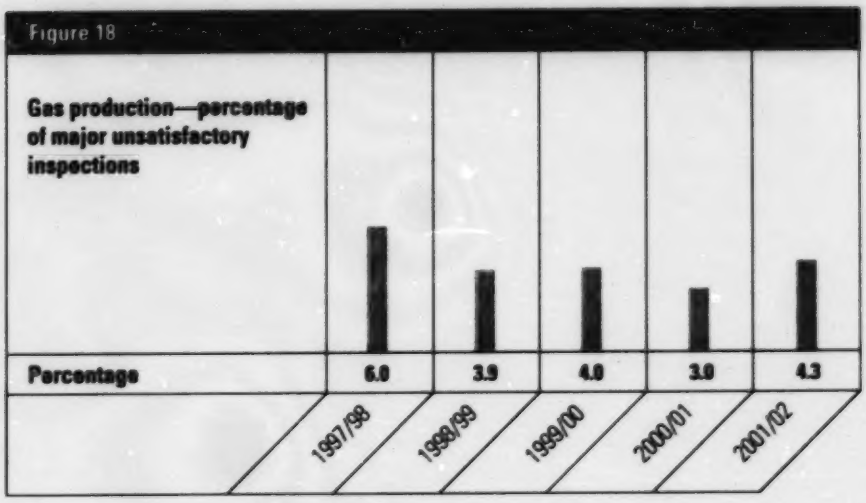



Figure 18



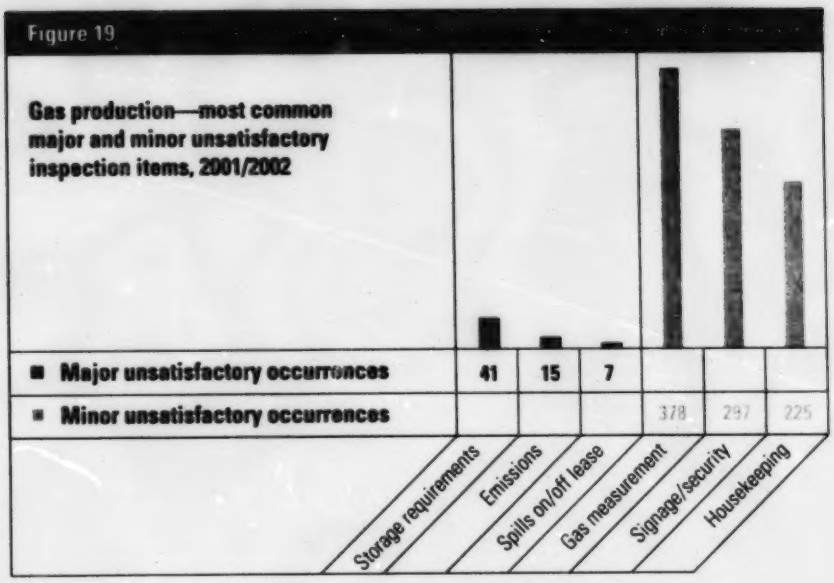

Noncompliance with storage requirements (no tank dikes), off-lease sour gas emissions, and unaddressed hydrocarbon spills were the most common major deficiencies, accounting for 79 per cent of all major unsatisfactory inspections during 2001/2002 (see Figure 19). Gas measurement problems, improper lease signage, and poor housekeeping practices accounted for 68 per cent of all minor deficiencies recorded. Lack of public and/or EUB notifications were the most common problems associated with sweet and sour gas well test flaring operations.

***EUB Action***

- EUB field staff will continue using a priority inspection selection process (OSI; see Section 1.3), focusing on companies with a noncompliant inspection history and gas processing facilities having the greatest potential to impact the public or the environment.

Figure 19

**Gas production—most common major and minor unsatisfactory inspection items, 2001/2002**




- EUB field staff will continue to focus on operator awareness and education programs. These presentations and information sessions improve industry's understanding of EUB requirements and enforcement policies.

- EUB field staff will continue to conduct gas plant operational audits, focusing primarily on environmental and public safety issues and verifying industry's understanding of and compliance with regulatory requirements and public expectations.

## 4.4 Gas Plant Flare Surveillance Program

The EUB requested 26 action plans from companies with gas processing facilities that exceeded the 0.5 per cent yearly flaring allowable for 2000. Operational problems, production accounting errors, and faulty measurement were the most common reasons why companies were reporting excessive flare volumes. A follow-up review of these flaring reports indicated the 26 facilities had an overall flare volume reduction of 24 064.8 thousand cubic metres from the previous year.

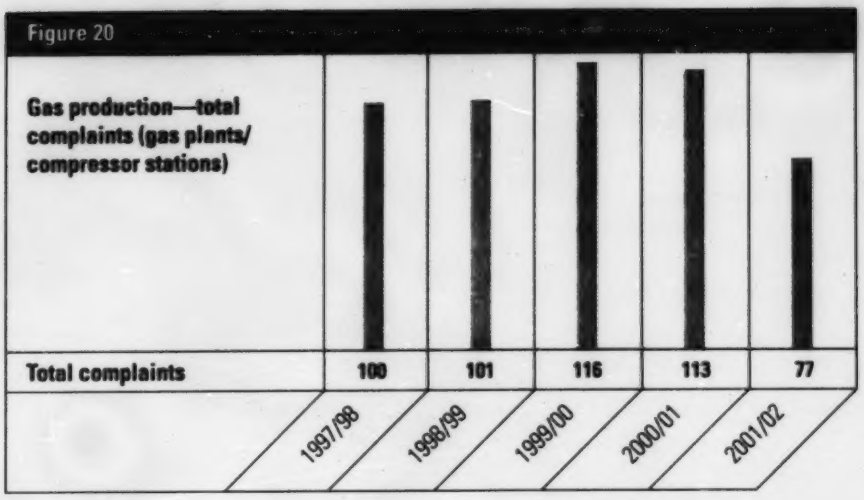
### *EUB Action*

- The EUB believes this program is worthwhile and will continue it in 2002/2003.

## 4.5 Public Complaints

The number of public complaints from gas processing facilities (gas plants and compressor stations) decreased substantially, from 113 in 2000/2001 to 77 in 2001/2002 (see Figure 20). Of the 179 complaints directed at gas well installations, 30 per cent were attributed to flaring operations. This compares to 142 complaints from gas well installations in 2000/2001.

Figure 20




The impact gas processing facilities have on the public continues to be a concern to the EUB. Fugitive emissions, noise from compressors, flaring, and black smoke are the primary issues affecting the public.

***EUB Action***

- Inspection audits of well test flaring operations will continue to be a priority. EUB field staff will focus on flaring operations in populated areas and those wells containing greater than 5 per cent $H_2S$.
- Although the number of public complaints related to gas processing facilities has decreased, field staff will continue to emphasize this area to ensure that improvements continue.
- The EUB will continue working closely with the CASA Flaring/Venting Project Team to assess the solution gas flaring management framework, as well as addressing a broader range of flaring and venting issues in Alberta.

## 4.6 Sulphur Recovery

Sulphur recovery efficiencies at gas plants, recovering salable sulphur, increased from 98.8 per cent in 2000 to 98.9 per cent in 2001. Overall, sulphur emissions decreased by 12.8 per cent in 2001 (from 78 000 tonnes to 68 000 tonnes), primarily due to decreased sulphur inlet rates and industry's awareness of EUB *Interim Directive (ID) 2001-3: Sulphur Recovery Guidelines for the Province of Alberta.* This resulted in major improvements to several of the larger gas processing facilities (see Figure 21) in the province.

## 4.7 Inspection Manual Review

***EUB Action***

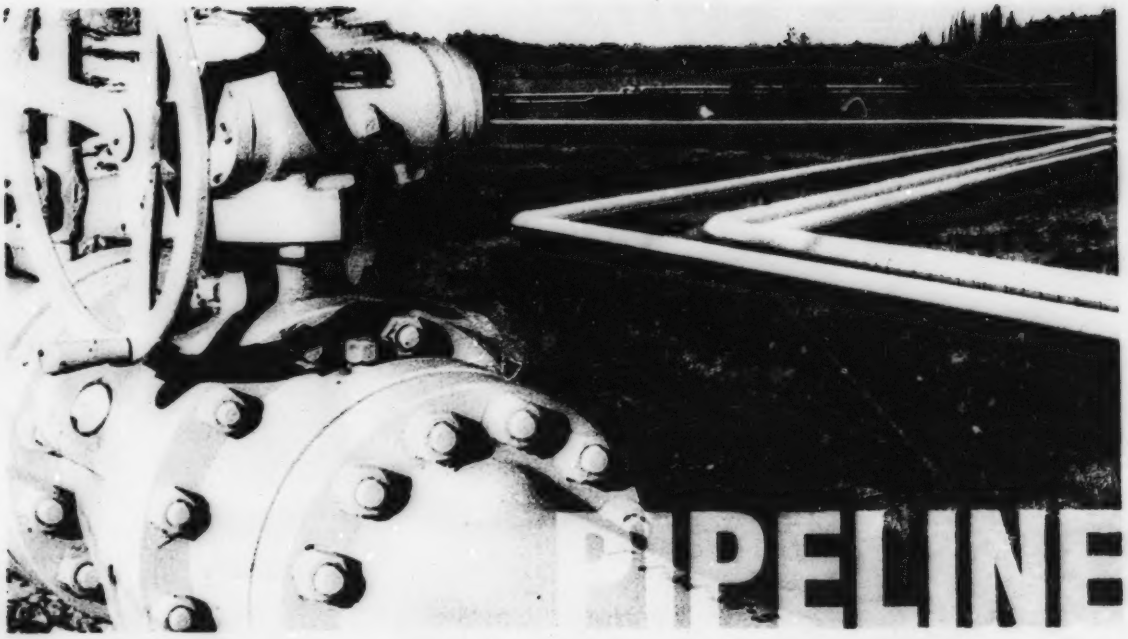
- *Guide 64: Facility Inspection Manual* has been revised and updated. The new edition will be released in mid-2002.

Figure 21

**Efficiency versus emissions of sulphur recovery plants**



| Year | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sulphur emissions** (thousand tonnes) | 200 | 273 | 264 | 229 | 216 | 165 | 159 | 158 | 149 | 145 | 128 | 113 | 110 | 115 | 105 | 93 | 102 | 103 | 92 | 91 | 86 | 89 | 88 | 85 | 81 | 83 | 81 | 82 | 82 | 78 | 68 |
| **Recovery efficiency** (percentage) | 95.7 | 95.0 | 96.4 | 96.7 | 96.7 | 97.4 | 97.5 | 97.5 | 97.5 | 97.5 | 97.7 | 97.8 | 97.9 | 97.8 | 97.9 | 98.2 | 98.0 | 98.0 | 98.1 | 98.1 | 98.3 | 98.3 | 98.6 | 98.7 | 98.7 | 98.7 | 98.7 | 98.7 | 98.7 | 98.8 | 98.9 |




# 5 Pipeline

## 5.1 Introduction

Companies operating pipelines in Alberta are responsible for complying with all applicable standards and EUB regulations.

EUB field staff conduct inspections based on the following criteria:

- operator inspection history,
- site sensitivity, and
- inherent risk.

Inspection processes are in place to monitor compliance and apply enforcement measures for noncompliance. (See Section 1.3 for additional information on the EUB's inspection criteria and for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections.) During the past year, when major or serious unsatisfactory inspection items were found, the pipeline was suspended until appropriate remedial action was taken (see Table 2, page 5).

The EUB field staff focus their activities on four key inspection areas:

1) **Pipeline failures/hits**—The Alberta Pipeline Act requires all licensees of pipelines to report any pipeline failures/hits to the EUB regardless of the cause, magnitude, or consequence. EUB field staff verify the cause of the failure/hit and ensure that mitigative measures are taken to prevent future failures/hits.

2) **Construction and pressure testing**—EUB field staff conduct inspections on new pipeline installations to ensure compliance with the requirements.

3) **Operations inspections**—EUB field staff conduct inspections on existing pipeline systems to ensure that operators conduct operational and maintenance activities in accordance with the requirements (maintenance of valves, cathodic protection systems, corrosion monitoring and control systems, right-of-way and warning signs, emergency contact numbers, etc.).

4) **Contact damage**—EUB field staff inspect sites where pipeline contact damage has occurred. Awareness seminars are held for operators and contractors to educate them on requirements that must be met prior to commencing ground disturbance activities to reduce incidents of pipeline hits, enhance public safety, and mitigate environmental impacts.

The length and type of permitted pipelines in Alberta under EUB jurisdiction for 1996-2001 are listed in Table 6.

**Table 6. Length of permitted pipelines by type in Alberta under EUB jurisdiction, 1996-2001 (km)**

| Year | Crude oil | Natural gas | Sour gas | Water | Multiphase | Others | Total |
|---|---|---|---|---|---|---|---|
| Total prior to 1996 | 13 126 | 122 283 | 8 003 | 14 021 | 33 501 | 16 148 | 207 081 |
| 1996 | 393 | 7 082 | 870 | 631 | 1 864 | 948 | 11 787 |
| 1997 | 938 | 9 798 | 1 377 | 1 225 | 3 058 | 1 550 | 17 947 |
| 1998 | 663 | 10 111 | 1 920 | 1 062 | 2 363 | 2 811 | 18 929 |
| 1999 | 1 086 | 9 541 | 1 574 | 605 | 1 510 | 1 725 | 16 042 |
| 2000 | 204 | 11 364 | 1 206 | 490 | 1 609 | 1 181 | 16 055 |
| 2001 | 408 | 12 539 | 1 504 | 773 | 2 389 | 1 164 | 18 777 |
| TOTAL | 16 818 | 182 718 | 16 454 | 18 807 | 46 294 | 25 527 | 306 618 |

[1] Numbers were calculated by adding all statuses (operating, permitted, abandoned, discontinued, and suspended) for all types of pipelines as of December 31 of each year.

## 5.2 Pipeline Failures/Hits

A pipeline failure is defined as the failure of the pipeline to contain the substance being transported. For statistical purposes, it is designated as a hit, leak, or rupture.

- A hit is defined as striking a buried pipeline during a ground disturbance activity resulting in the pipeline or pipeline coating being damaged. A release of product does not necessarily result.

- A leak is defined as an opening, crack, or hole in a pipeline causing some product to be released, but not immediately impairing the operation of the pipeline.

- A rupture is defined as the instantaneous tearing or fracturing of the pipeline material, immediately impairing the operation of the pipeline.

The EUB's release reporting and inspection priority system applies to all pipeline releases and is defined as follows:

- Priority 1 releases pose the threat of serious environmental and public impacts and are inspected immediately. In most cases, EUB field staff immediately respond to the location; however, when that is not possible, all attempts are made to have another regulatory agency respond. In these cases, EUB staff will conduct an inspection as soon as they can and will inspect 100 per cent of priority 1 releases.

- Priority 2 releases are mid- to high-volume releases but may include low-volume releases if the operator is new or has a poor inspection history. These sites are generally inspected within 10 working days.

- Priority 3 releases are low-volume releases but may include medium-volume releases if the operator has a good inspection history. In these cases, EUB staff have a high degree of confidence that the release will be appropriately handled. Historically, approximately 25 per cent of priority 3 spills are inspected.

If a pipeline failure/hit occurs, the licensee or operating company is required to inform the local EUB Field Centre. EUB field staff record the information into a database, including date of occurrence, geographic location, pipeline specifications, operating conditions, environmental release information, cause, and priority rating of the release.

The following is a summary of the pipeline releases/hits from April 1, 2001, to March 31, 2002:

| | | | |
|---|---|---|---|
| Ruptures | 4.0% | Priority 1 releases | 2.5% |
| Leaks | 90.2% | Priority 2 releases | 15.8% |
| Hits, no release | 5.8% | Priority 3 releases | 75.9% |
| | 100% | No release | 5.8% |
| | | | 100% |

There were 32 ruptures in 2001/2002, a decrease from the 39 ruptures last year.

Figure 22 indicates that the number of priority 1 releases has remained low. Sensitive leak detection systems, training and awareness programs, automated shut-in equipment, and pipeline patrols (aerial and ground) being used by industry have all contributed to this decline.

Table 7 shows the various causes of failures and corresponding inspections during the 2001/2002 reporting year.

All failure incidents are reviewed with the company when the EUB Field Centre is notified about them. EUB field staff require the company to perform a failure analysis, prove integrity, and mitigate further occurrences.

EUB field staff conducted 523 inspections in 2001/2002, focused primarily on corrosion-related failures, compared to 482 inspections last year. There were 23 major unsatisfactory inspections and one serious unsatisfactory inspection. All unsatisfactory items were brought into compliance.

Figure 22

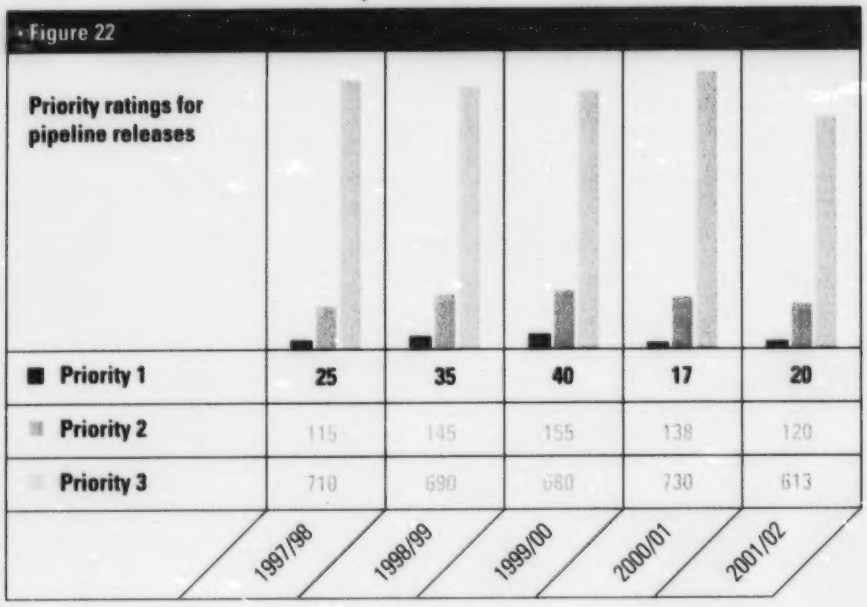



**Table 7. Failures/hits reported from April 1, 2001, to March 31, 2002[1]**

| | Incidents | | Leaks | | Ruptures | |
|---|---|---|---|---|---|---|
| Cause | # | % | # | Inspections | # | Inspections |
| Internal corrosion | 425 | 52.7 | 424 | 252 | 1 | 1 |
| External corrosion | 78 | 9.7 | 78 | 62 | 0 | 0 |
| Weld corrosion | 1 | 0.1 | 1 | 1 | 0 | 0 |
| Joint failure | 21 | 2.7 | 21 | 13 | 0 | 0 |
| Mechanical joint | 7 | 0.8 | 7 | 2 | 0 | 0 |
| Girth weld | 15 | 1.9 | 14 | 10 | 1 | 1 |
| Construction damage | 49 | 6.1 | 47 | 38 | 2 | 2 |
| Damage by others (hits with release) | 33 | 4.0 | 17 | 14 | 16 | 15 |
| Damage by others (hits, no release) | 47 | 5.8 | 0 | 41 | 0 | 0 |
| Earth movement | 12 | 1.5 | 12 | 7 | 0 | 0 |
| Mechanical damage | 2 | 0.2 | 2 | 1 | 0 | 0 |
| Fittings/valve failure | 15 | 1.9 | 15 | 3 | 0 | 0 |
| Installation failure | 3 | .3 | 3 | 1 | 0 | 0 |
| Weld failure | 11 | 1.5 | 11 | 8 | 0 | 0 |
| Seam failure | 8 | 1 | 5 | 5 | 3 | 2 |
| Pipe body failure | 36 | 4.4 | 34 | 25 | 2 | 1 |
| Overpressure | 12 | 1.5 | 8 | 5 | 4 | 1 |
| Operator error | 7 | 0.8 | 5 | 4 | 2 | 1 |
| Miscellaneous | 9 | 1.1 | 8 | 4 | 1 | 0 |
| Unknown | 17 | 2.0 | 17 | 3 | 0 | 0 |
| TOTAL | 808 | 100 | 729 | 499 | 32 | 24 |
| **% OF INCIDENTS** | | 100 | 90.2 | | 4.0 | |

[1] Statistics include 35 requalification test failures.

As a result of the failure inspections, companies were required to do one or more of the following:

- undergo requalification pressure testing (of the 463 pipelines tested, 35 failed during the requalification pressure test)
- submit failure mechanism reports (389 were required to identify mechanism of failure)
- amend licences (there were 200 amendments to replace or internally line the pipe with a new corrosion barrier or to abandon the line)
- other requirements
  - determine product flow velocities
  - conduct analysis of product shipped and received (sampling)
  - modify system to enable corrosion rate monitoring
  - install corrosion control devices (inhibitor injection probes, sacrificial anodes, impress current anodes)
  - conduct internal electromagnetic or ultrasonic inspections
  - conduct cathodic protection surveys
  - install pigging facilities
  - conduct risk assessments

Figures 23, 24, and 25 are overviews of historical data compared to the most recent year reported.

Figure 23 indicates that the distribution of all failure causes has remained relatively constant. Corrosion continues to be the main cause of pipeline failures. Although the percentage of corrosion failures has dropped from 68 per cent in 2000 to 65 per cent in 2001, the EUB is still concerned about the number of corrosion problems. The implementation of *Guide 66: Pipeline Inspection Manual* has clarified EUB expectations for identifying and addressing corrosion problems. In addition, *Guide 66* outlines the EUB's enforcement policy related to pipeline corrosion deficiencies.

Figure 24 indicates that natural gas incidents have decreased significantly compared to previous years. This is due primarily to the efforts to reduce natural gas failures in south-eastern Alberta. In addition, most of the product failures are indicating a downward trend, as new nonmetallic materials are being used as corrosion barriers and technology improves in all areas of corrosion monitoring and mitigation.

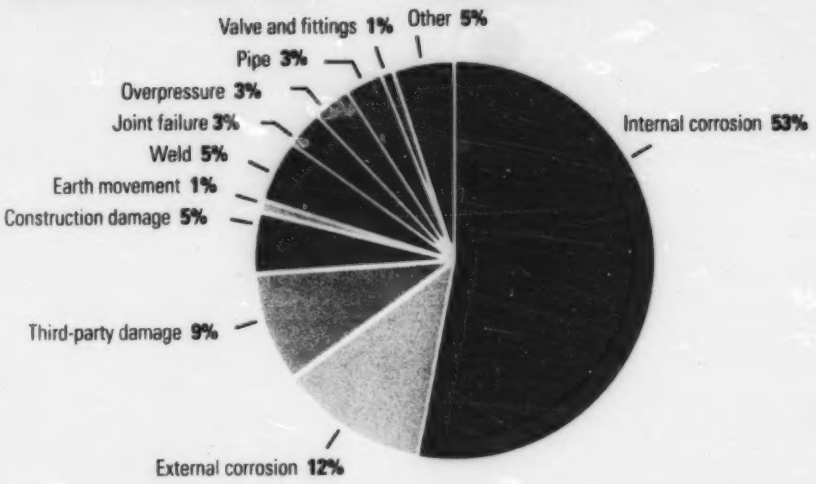
Figure 25 indicates that the majority of failures are occurring in smaller-diameter gathering lines, primarily in 60.3 mm (2 inch), 88.9 mm (3 inch), and 114.3 mm (4 inch) systems.

The overall failure frequency in 1988 was approximately five failures per 1000 km. In 2001, the failure frequency has been reduced to approximately 2.8 failures per 1000 km (Figure 26).

Figure 23

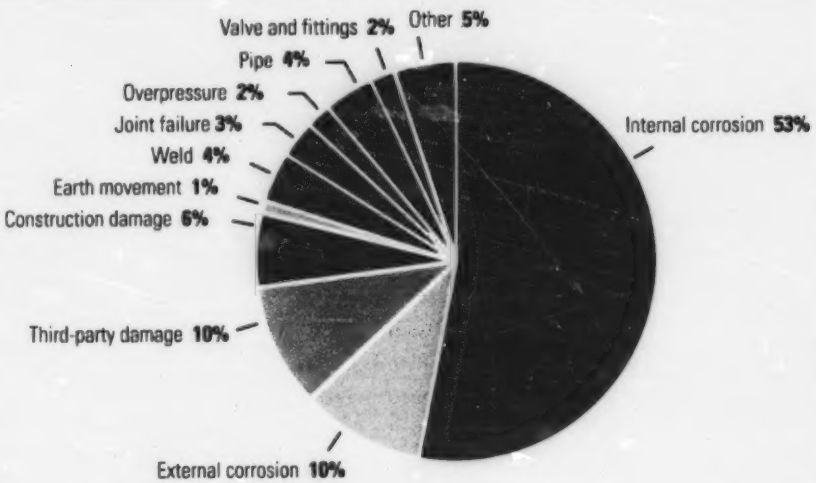
**Historical pipeline failures by cause (%)**

**1980 - March 31, 2002**




**Pipeline failures by cause (%)**

**April 1, 2001 - March 31, 2002**

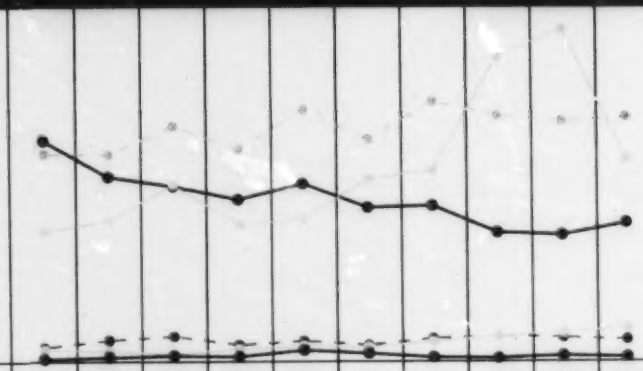



A number of organizations contribute considerable resources towards pipeline integrity, maintenance, operations, and safety. These include

- Alberta One-Call
- Canadian Association of Petroleum Producers (CAPP)
- Canadian Centre for Materials and Energy Technology (CANMET)
- Canadian Energy Pipeline Association (CEPA)
- Canadian Standards Association (CSA)
- National Association of Corrosion Engineers (NACE)
- Pipeline Risk Assessment Steering Committee (PRASC)

Figure 24

**Historical pipeline incidents by product being transported**



| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000/01 | 2001/02 |
|---|---|---|---|---|---|---|---|---|---|---|
| Water | 279 | 233 | 221 | 204 | 224 | 194 | 196 | 162 | 159 | 174 |
| Multiphase | 262 | 261 | 297 | 268 | 318 | 280 | 328 | 310 | 303 | 308 |
| Crude | 17 | 26 | 31 | 20 | 25 | 20 | 28 | 31 | 29 | 26 |
| Sour gas | 14 | 12 | 9 | 10 | 10 | 11 | 21 | 23 | 33 | 41 |
| Natural gas | 164 | 177 | 223 | 172 | 179 | 230 | 241 | 385 | 420 | 255 |
| All other | 2 | 4 | 6 | 5 | 13 | 9 | 4 | 3 | 6 | 4 |

Regional, national, and international pipeline conferences and workshops are held to share technology and information. Their success is being demonstrated in the field through a reduction in pipeline failure frequency.

***EUB Action***

- EUB field staff will continue to investigate 100 per cent of first-time corrosion system failures when the failure mechanism is unknown.

- Pipeline corrosion will continue to be an area of focus due to the number of failures. The EUB investigation requires a laboratory analysis of the failed pipeline segment if there has been no previous inspection history. Companies must implement recommendations from these assessments to mitigate future occurrences of pipeline corrosion.

- The significant decrease in the number of low-pressure natural gas failures in south-eastern Alberta was due, in part, to efforts of a synergy group that was formed to address the problem. The EUB will work with this group to ensure that lasting improvement continues.

Figure 25

**Number of failures by pipeline size**

| | 60.3 mm (2") | 88.9 mm (3") | 114.3 mm (4") | 168.3 mm (6") | 219.1 mm (8") | 273.1 mm (10") | 323.9 mm (12") | 355.6 mm (14") | 406.4 mm (16") | >406.4 mm (>16") |
|---|---|---|---|---|---|---|---|---|---|---|
| 1997 | 176 | 270 | 132 | 60 | 24 | 11 | 14 | 0 | 3 | 2 |
| 1998 | 158 | 282 | 134 | 61 | 26 | 20 | 4 | 5 | 5 | 3 |
| 1999 | 191 | 323 | 121 | 79 | 27 | 5 | 12 | 1 | 1 | 4 |
| 2000/2001 | 215 | 318 | 167 | 93 | 25 | 9 | 11 | 2 | 2 | 12 |
| 2001/2002 | 163 | 324 | 172 | 89 | 31 | 13 | 10 | 0 | 2 | 4 |

Figure 26

**Failure incidents compared to total pipeline length**

| | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|
| **Length of pipeline** (1000s of km) | 237 | 256 | 272 | 288 | 306 |
| **Ratio** (failures/1000 km) | 32 | 32 | 34 | 33 | 28 |

## 5.3 Construction and Testing Inspections

EUB field staff inspected 239 companies for a total of 497 pipeline construction/test inspections in 2001/2002. Of these, 443 were satisfactory inspections, 38 were minor unsatisfactory inspections, and 16 were major unsatisfactory inspections. There were no serious unsatisfactory inspections. All unsatisfactory inspection items were brought into compliance. This compares to 607 pipeline construction/test inspections conducted last year, of which there were 503 satisfactory inspections, 91 minor unsatisfactory inspections, 13 major unsatisfactory inspections, and no serious unsatisfactory inspections. Examples of the unsatisfactory items found include the following:

- Minor unsatisfactory inspection items
  - Pipeline applications did not reflect proper information (pipe size, wall thickness, grade of pipe, and correct routing to and from locations). Note that in all cases the materials actually used exceeded requirements. Amendments were required to correct the pipeline applications.

- Major unsatisfactory inspection items
  - Wall thickness of pipeline at road crossings was improper.
  - Pipeline girth welds were not 100 per cent radiographed for sour service.
  - An existing pipeline was hit during construction and the company failed to report the incident to the EUB.
  - Pipeline was marked in the wrong location; hand excavation should have been done to verify the correct location.
  - Foreign pipelines were not marked and work progressed in a controlled area.
  - Machinery was working within 60 cm of pipeline without supervision.

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- Based on the pipeline inspection criteria, EUB field staff will continue to inspect new pipeline installations. The EUB will continue to ensure that industry is aware of regulatory requirements and the consequences of noncompliance.

## 5.4 Operations Inspections

In 2001/2002 EUB field staff conducted 234 operations inspections on 56 companies. These detailed inspections involve a field inspection of the pipeline system and a records review of maintenance documentation. The results were 120 satisfactory inspections, 92 minor unsatisfactory inspections, and 22 major unsatisfactory inspections. There were no serious unsatisfactory inspections during 2001/2002. All unsatisfactory inspection items were brought into compliance. This compares to 275 inspections conducted last year, of which there were 95 satisfactory inspections, 159 minor unsatisfactory inspections, 21 major unsatisfactory inspections, and no serious unsatisfactory inspections. Examples of the unsatisfactory items found include the following:

- Minor unsatisfactory inspection items
  - Signage was missing, defaced, or had incorrect company contact phone numbers.
  - Record updates to indicate proper operating status of pipeline were incomplete.
  - Documentation of right-of-way patrols was not complete.

- Major unsatisfactory inspection items
  - Emergency procedures manual information was incorrect.
  - Valves/fittings or flanges were not properly rated for pressure of system.
  - Cathodic protection surveys were not performed.
  - No cathodic protection or internal corrosion monitoring was in place.

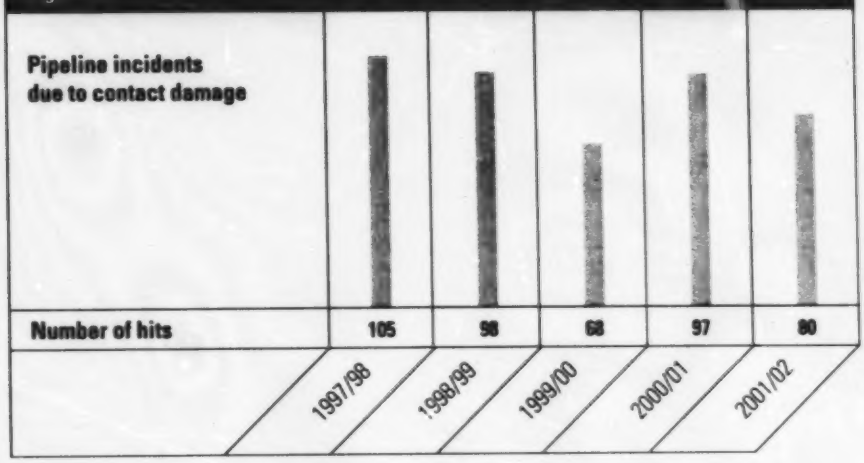
*EUB Action*

- EUB field staff will continue to conduct operations inspections in 2002/2003. The EUB is concerned about companies that fail to submit licence transfers and amendments. This results in inaccurate pipeline data with respect to ownership, signage, emergency contacts, and operation status and weakens the overall integrity of pipeline systems. The EUB's new field inspection system (FIS; see Section 1.7.3) will improve this situation.

## 5.5 Contact Damage

The goal of this inspection area is prevention of pipeline damage (hits). If a company does not follow ground disturbance regulations, the EUB will apply enforcement, as outlined in *IL 99-4: EUB Enforcement Process.* There were 80 contact damage incidents recorded in 2001/2002 (see Figure 27). Of these, 25 incidents were found to have major noncompliance items and 1 had serious noncompliance items. All noncompliance issues were addressed. The remaining 54 incidents did not warrant enforcement action following an EUB review. This compares to 97 incidents last year, of which 35 incidents had major noncompliance items and 3 had serious noncompliance items.

Figure 27




EUB field staff conducted 21 ground disturbance seminars for companies that were in violation of the requirements. A further 57 seminars were held for educational purposes, with approximately 1470 people from industry and the public attending.

Other organizations work diligently to prevent pipeline and utilities damage. Of particular note is the Edmonton Area Pipeline and Utilities Operators' Committee (EAPUOC), which, in the event of an emergency, organizes and facilitates communication among owners of buried pipelines, utility installations, emergency responders, and regulators. Each year EAPUOC organizes an emergency training exercise and a safety seminar for the general public and industry.

***EUB Action***

- The EUB will continue to focus on educating parties that have been involved in pipeline hits in an effort to reduce the potential for future incidents. The EUB is proposing revisions to the Pipeline Regulation to address this issue.

## 5.6 Public Complaints Associated with Pipeline Operations

There were 79 complaints associated with pipeline operations. The majority of complaints were a result of odours and spills from pipeline failures or venting of gas at pigging facilities and pipeline terminals.

# 6 Environment

## 6.1 Introduction

One of the most important responsibilities the EUB has is the protection of the environment. EUB field staff have developed both internal and collaborative processes with other government agencies to minimize the environmental impacts from industry operations. EUB field staff inspect spills, drilling waste, and waste management facilities. In addition, Field Surveillance has two mobile air-monitoring units to supplement inspections where fugitive emissions are suspected.

## 6.2 Spills and Releases

### 6.2.1 Spill and Release Statistics and Inspections

A key goal of the EUB is to minimize the effects of spills regardless of where they occur. To ensure the most efficient and effective response, Alberta Environment (AENV) and the EUB developed a memorandum of understanding that outlines the response requirements for industry when a spill occurs. EUB *IL 98-1: A Memorandum of Understanding between Alberta Environmental Protection and the Alberta Energy and Utilities Board Regarding Coordination of Release Notification Requirements and Subsequent Regulatory Response* defines these roles and responsibilities.

The ideal situation would be the elimination of all spills. However, the goal is to minimize the effects of spills and releases. To accomplish this, companies must ensure that

- the source of the spill is stopped,
- the spill is contained,
- the free fluids are recovered, and
- the spill site is remediated in accordance with AENV guidelines.

Releases are prioritized by the EUB to allow for an appropriate, timely, and effective response:

- Priority 1 releases pose the threat of serious environmental and public impacts and are inspected immediately. In most cases, EUB field staff immediately respond to the location; however, when that is not possible, all attempts are made to have another regulatory agency respond. In these cases, EUB staff will conduct an inspection as soon as they can and will inspect 100 per cent of priority 1 releases.

- Priority 2 releases are mid- to high-volume releases but may include low-volume releases if the operator is new or has a poor inspection history. These sites are generally inspected within 10 working days.

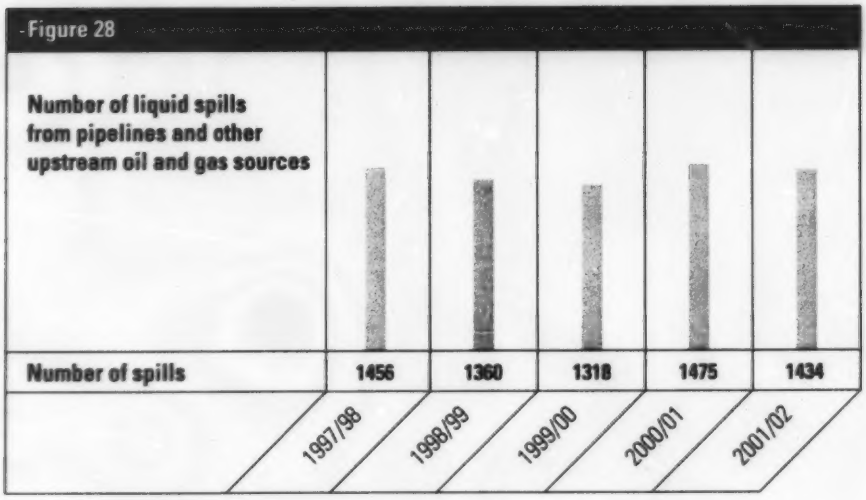
- Priority 3 releases are low-volume releases but may include medium-volume releases if the operator has a good inspection history. In these cases, EUB staff have a high degree of confidence that the release will be appropriately handled. Historically, approximately 25 per cent of priority 3 spills are inspected.

A comparison of the number of liquid spills since 1997/1998 is provided in Figure 28. As shown, a total of 1434 releases were reported to the EUB's eight Field Centres in the past year, a decrease from 1475 in the previous year. Of those,

- 30 were priority 1 (2 per cent),
- 293 were priority 2 (20 per cent), and
- 1111 were priority 3 (78 per cent).

It is important to note that more than three-quarters of all spills were low volume and usually contained on lease. Inspections were conducted on 653 spills. There were 611 satisfactory spill inspections, 23 minor unsatisfactory spill inspections, 19 major unsatisfactory spill inspections, and no serious unsatisfactory spill inspections (see Section 1.3 for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections).

Figure 28



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- The number of liquid releases decreased and could be reduced further if industry improved maintenance and pipeline corrosion control programs. The EUB continues to work with industry towards those goals.

- EUB staff will continue to focus on ensuring industry compliance with EUB *Guide 55: Storage Requirements for the Upstream Petroleum Industry*, as well as educating operators on the importance of preventive maintenance. Compliance with *Guide 55* will assist in keeping spills confined to a smaller area, reducing the environmental impact.

### 6.2.2 Main Causes of Releases

Pipeline corrosion, equipment failure, and operator errors were the leading causes of liquid releases in 2001/2002. Figure 29 shows the most significant sources and causes of releases and clearly indicates that industry must become more effective with its preventive maintenance and corrosion control programs.

Figure 29

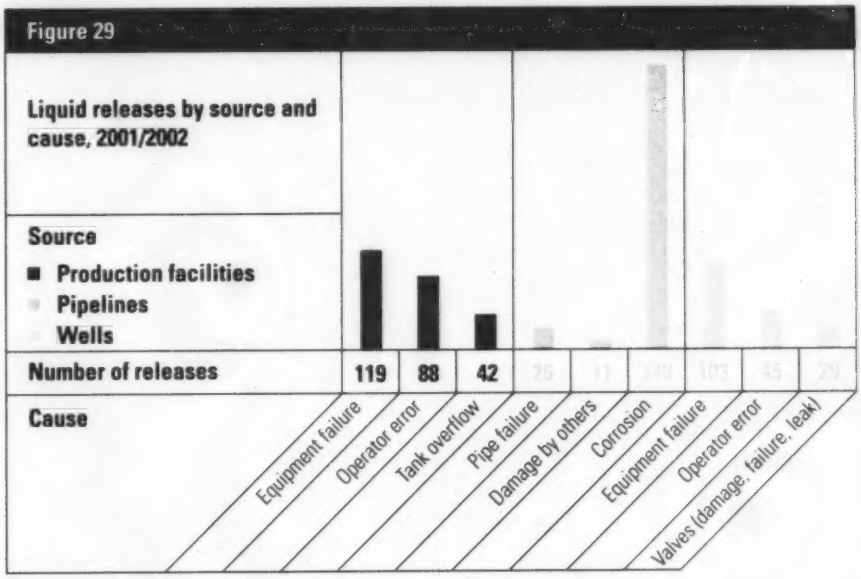


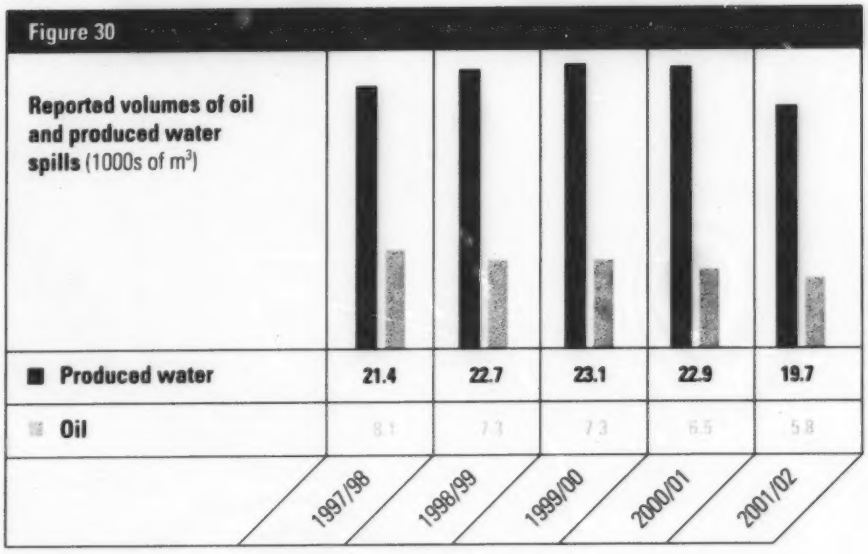

Figure 30 provides the volume of oil and produced water spills over a five-year period. The spill volumes of hydrocarbon and produced water for 2001/2002 were 5877.3 cubic metres ($m^3$) and 19 748.0 $m^3$ respectively. This is a reduction from 2000/2001 release volumes of 6469.1 $m^3$ hydrocarbon and 22 874.0 $m^3$ produced water.

### 6.2.3 Release Prevention

Spill response training exercises ensure that industry personnel are adequately trained to effectively respond to spills, thereby minimizing the impacts on the environment and the public. There are 17 oil spill cooperatives throughout the province.

In 2001/2002, EUB field staff attended all 17 oil spill cooperative training exercises and gave presentations on

Figure 30




- release statistics,
- release reporting requirements, and
- regulatory changes and updates.

The presentations have a provincial focus but are tailored to address local issues and concerns. The EUB will continue to participate in cooperative meetings and exercises.

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- The EUB strongly supports the spill cooperatives and regularly participates with groups such as the Western Canadian Spill Services (WCSS) to enhance spill response preparedness throughout the province. Cooperative meetings and spill exercises provide EUB staff with the opportunity to communicate the importance of spill prevention.

- The EUB, WCSS, and industry are working together to develop proactive measures that can be implemented to prevent spills.

## 6.3 Mobile Ambient Air Quality Monitoring

### 6.3.1 The EUB's General Approach to Monitoring

Field Surveillance has two ambient air-monitoring units to monitor facilities for fugitive emissions. Both units are equipped with analyzers capable of reading and recording $H_2S$ and sulphur dioxide ($SO_2$) emissions. This equipment improves EUB staff ability to conduct mobile and stationary ambient air monitoring throughout the province.

### 6.3.2 Routine and Complaint Response Monitoring

In 2001/2002, the EUB monitored 196 facilities for $H_2S$ and $SO_2$ emissions, compared to 28 facilities in 2000/2001. Twenty-two facilities were found to have off-lease emission problems (11.2 per cent, compared with [illegible] per cent in 2000/2001). Immediate corrective action was taken at all 22 facilities, and in some cases facility operations were suspended.

The most common sources of emissions were leaking tank hatches and ineffective vapour gathering systems.

In addition to carrying out routine monitoring and responding to complaints, the mobile monitoring units can be used in emergency response situations. However, the monitoring units were not required in an emergency situation in the 2001/2002 reporting year.

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- The report of the Advisory Committee on Public Safety and Sour Gas recommended that "the EUB enhance its capability to conduct monitoring as part of its complaint response and compliance programs." In response to this recommendation, the EUB purchased a second air-monitoring unit to enhance its air-monitoring capabilities.

- The EUB will continue to use the criteria outlined above to identify and prioritize facilities for monitoring air quality.

## 6.4 Waste Management Initiatives

### 6.4.1 Waste Management Facilities

EUB *Guide 63: Oilfield Waste Management Facility Inspection Manual* was issued in January 2001 to inform industry of the EUB's requirements and expectations. There are 62 oilfield waste management facilities approved by the EUB. Waste management facilities, as described in *Guide 58: Oilfield Waste Management Requirements for the Upstream Petroleum Industry*, include

- waste storage facilities,
- waste transfer stations,
- waste processing facilities,
- surface facilities associated with waste disposal wells,
- waste disposal wells (classes 1a and 1b),
- caverns,
- landfills,
- biodegradation facilities, and
- thermal treatment facilities.

In 2001/2002, field staff conducted 54 waste management inspections, which resulted in 27 satisfactory inspections, 23 minor unsatisfactory inspections, 4 major unsatisfactory inspections, and no serious unsatisfactory inspections. Off-lease odours, failure to meet *Guide 55* storage requirements, and staining/spillage were the most common deficiencies identified. All facilities were brought into compliance.

Six audit/inspections conducted jointly with the EUB's Operations Section found deficiencies at all six. All of these facilities were brought into compliance.

***EUB Action***

- Waste management facility inspections will focus on companies with poor inspection histories. Facilities that received a major unsatisfactory inspection in 2001/2002 will be the highest priority.
- Audit/inspections will be conducted on 12 facilities in 2002/2003.
- EUB field staff will continue to meet with facility operators to ensure a complete understanding of EUB requirements.

### 6.4.2 Drilling Waste Management

EUB *Guide 50: Drilling Waste Management* is the key document regulating drilling waste disposal. Two government agencies are responsible for regulating drilling waste management in Alberta:

- EUB, for private land, and
- Sustainable Resource Development (SRD), for public land (white and green areas).

Drilling waste disposal methods are identified in *Guide 50* as being either routine or nonroutine:

- routine – any disposal described in *Guide 50* that does **not** require preapproval (e.g., mix-bury-cover, landspray, landspray while drilling, and pump-off)
- nonroutine – any disposal described in *Guide 50* that requires preapproval (e.g., land treatment, biodegradation treatments, and alternative disposals)

In February 2002, EUB *Guide 70: Drilling Waste Disposal Inspection Manual* was released to ensure that EUB drilling waste disposal inspections are carried out in a consistent manner. The guide is also intended to inform industry of EUB expectations and requirements.

In 2001/2002, 86 nonroutine drilling waste sites were inspected. Of those, 65 had satisfactory inspections, 20 had minor unsatisfactory inspections, and 1 had a major unsatisfactory inspection. There were no serious unsatisfactory inspections. All of the unsatisfactory inspection items have been brought into compliance. This compares to 2000/2001, when 91 nonroutine drilling waste sites were inspected and 78 had satisfactory inspections, 9 had minor unsatisfactory inspections, and 4 had major unsatisfactory inspections.

Nonroutine disposal sites that recorded unsatisfactory inspection items in 2001/2002 will be scheduled for inspection in 2002/2003. In addition, field staff will continue to conduct inspections on invert (oil-based) drilling waste treatment sites on private lands in Alberta.

In 2001/2002, 179 routine drilling waste disposal inspections were conducted. Of those, 125 had satisfactory inspections, 40 had minor unsatisfactory inspections, and 14 had major unsatisfactory inspections. There were no serious unsatisfactory inspections. All the unsatisfactory inspection items were brought into compliance.

***EUB Action***

- *Guide 50: Drilling Waste Management* is being further updated and is scheduled for completion in 2004.